



LOCAL AIR QUALITY MANAGEMENT PROGRESS REPORT – 2007.

Part IV of the Environment Act 1995

Prepared by:

**Arun District Council
with assistance from the
Sussex Air Quality Partnership**

April 2007

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IV. SUMMARY

Table 1 below shows that Arun District Council found no exceedances of the UK air quality objectives for 2007.

Table 1 – Summary of pollutants measure in 2006 relative to the UK air quality objectives in the Arun District Council

Pollutant	Air Quality Objective		2006 Measurements (Local or Sussex AQMS)	
	Conc.	Measured as		Exceedance
Benzene	5 µg/m ³	-Annual mean	1.13 µg/m ³ (Hove)	No
1,3 Butadiene	2.25 µg/m ³	-Running annual mean	Not measured	No
Carbon monoxide	10.0 mg/m ³	-Maxi daily running 8-hour mean	3.2 µg/m ³ (Hove)	No
Lead	0.25 µg/m ³	-Annual mean	Not measured	No
Nitrogen dioxide	40 µg/m ³	- Annual mean	37.8 µg/m ³	No
Particles (PM ₁₀) (gravimetric)	50 µg/m ³ not to be exceeded more than 35 times a year	- 24 hour mean	Not measured	No
	40 µg/m ³	- Annual mean		No
Sulphur dioxide	350 µg/m ³ not to be exceeded more than 24 times a year	- 1 hour mean	77 µg/m ³ (max) (Hove)	No
	125 µg/m ³ not to be exceeded more than 3 times a year	- 24 hour mean	16.6 µg/m ³ (max) (Hove)	No
	266 µg/m ³ not to be exceeded more than 35 times a year	- 15 minute mean	122 µg/m ³ (max) (Hove)	No

1. Introduction

Under the Environment Act 1995, local authorities are required to Review and Assess (R&A) air quality on a regular basis. A *review* of air quality means a consideration of the levels of pollutants in the air for which objectives are prescribed in Regulations¹, and estimations of likely future levels. An *assessment* of air quality is the consideration of whether estimated levels for the relevant future period are likely to exceed the levels set in the objectives.

The first review and assessment round was completed in 2003. The main conclusion was that the national air quality objectives were not likely to be exceeded at any locations in Arun District.

This first round of R&A constitutes a benchmark against which Arun District Council can measure future progress in making improvements to the local air quality.

The new guidance issued by the Department for Environment, Food and Rural Affairs (DEFRA) requires those local authorities, who found no exceedance of the air quality objectives in the last Updating and Screening Assessments (USA), to undertake a Progress Report (PR) of local air quality by the end of April 2004 (LAQM.PRG03).

This Progress Report is intended to identify those aspects that have changed since the last round of review and assessment, the USA. The report concentrates on the progress on implementing local air quality management and achieving or maintaining concentrations below the air quality objectives. These aims are demonstrated by reporting on updated monitoring data and new local developments that might affect air quality.

The Progress Report will provide a summary of all available monitoring data, indicating monitored pollutants and specific locations within Arun District. The monitored data will be presented in a suitable format for comparison with the relevant air quality objectives.

¹ Air Quality Regulations for England (2000; Amendment Regulations 2002)

2. National Air Quality Objectives

The air quality objectives set out in the Air Quality Regulations provide the statutory basis for the system of Local Air Quality Management (LAQM). For each objective, local authorities have to consider present and likely future air quality, and assess whether the objectives are likely to be achieved in time.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	5 µg/m ³	Annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m ³	Maximum daily running 8-hour mean	31.12.2003
Lead	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

3. Information about Arun District Council

Arun District is a mixed urban / rural area covering 85 square miles, and has a population of over 140,000. Littlehampton and Bognor Regis are the main urban centres and the principal administrative and commercial centres within the district.

Arun District is well served by transport links to London, Gatwick Airport, the M25, the coast and Europe. A network of subsidiary routes connects the villages and small centres of population.

A large proportion of the district is composed of countryside with a varied landscape of woodland, downland, river valleys and meadows being represented. Areas of Outstanding Natural Beauty, Sites of Special Scientific Interest, and Sites of Nature Conservation Importance overlap the area. Agriculture remains a major user of land within the District. Map 1, Appendix I shows the District boundaries and major urban and rural centres.

Industrial Sources

Industrial sources are currently controlled under the Environmental Protection Act 1990, and are classified into either Part A (large industries such as power stations and chemical works) or Part B/A2 processes (such as crematoria, petrol stations, quarries, etc.) for guidance and control. Part A processes fall under the jurisdiction of the Environment Agency, whilst control of Part B/A2 processes is a duty carried out by local authorities. Those small industrial processes that fall outside of Part B/A2 Process control are also of concern. The review and assessment technical guidance (LAQM.TG03) and LAQM.TG(03) – Update: January 2006, requires details of boilers with a thermal rating of greater than 5 MW that burn coal or fuel oil (e.g. in universities, hospitals, etc.).

Lists of Part A, Part B/A2 and other processes of potential concern from within Arun District are given in Appendix II. Any significant or new changes to these sources of emissions are referred to in the relevant pollutant section.

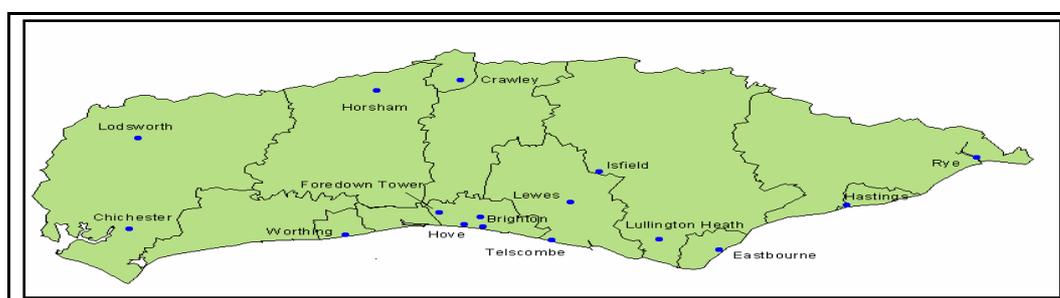
Transport/ Road traffic

No recent traffic counts have been carried out. It is anticipated that traffic counts will be undertaken before the next Updating and Screening Assessment in 2009.

4. New Monitoring Results

Monitoring of Air Quality across Sussex.

Arun District Council is a member of the Sussex Air Quality Partnership which benefits from the co-ordinated monitoring of air pollutants across the region. The group has access to monitoring stations and is able to make comparative and comprehensive assessments for the different pollutants required under LAQM. The Sussex Air Quality Network is managed and co-ordinated by Kings College London ERG who provide data calibration and ratification of results. The map of air quality stations is shown below:



Map 1: Sussex Air Quality Network (Jan. 2007)

The Sussex Air Quality Network is comprised of local authority air quality monitoring stations and has integrated data from national air quality stations (AURN - Lullington Heath, Brighton and Hove). The main pollutants monitored with automatic analysers are:

LA	POLLUTANTS	LOCATION
Brighton CC/AURN	CO, NOx, O3, PM10	Brighton Pavilion
Brighton CC/AURN	CO, NOx, O3, PAH	Hove Roadside
Brighton CC	O3	Foredown Tower
Crawley B.C.	NOx	East Gatwick
Eastbourne B.C.	PM10, NOx, O3	Devonshire Park
Lewes D.C.	PM10, NOx, O3,	Telscombe Cliffs
Lewes	PM10, NOx	Lewes Town Centre
Rother D.C.	O3	Rye Harbour
Hastings B.C.	PM10, NOx, O3	Hastings/Bexhill (A259)
Chichester D.C.	PM10, NOx, O3	A27 Ring Road
Chichester D.C.	O3	Lodsworth(ARMO)
Horsham D.C.	PM10, NOx, WDir, WSp	Horsham centre
Worthing B.C.	NOx	High St, Worthing
Wealden D.C.	O3	Isfield (ARMO)
E&W Sussex County C.	PM10, NOx, O3, CO	Mobile unit
DEFRA - AURN	NOx, O3	Preston Park, Brighton
DEFRA - AURN	NOx, O3, SO2	Lullington Heath, Wealden

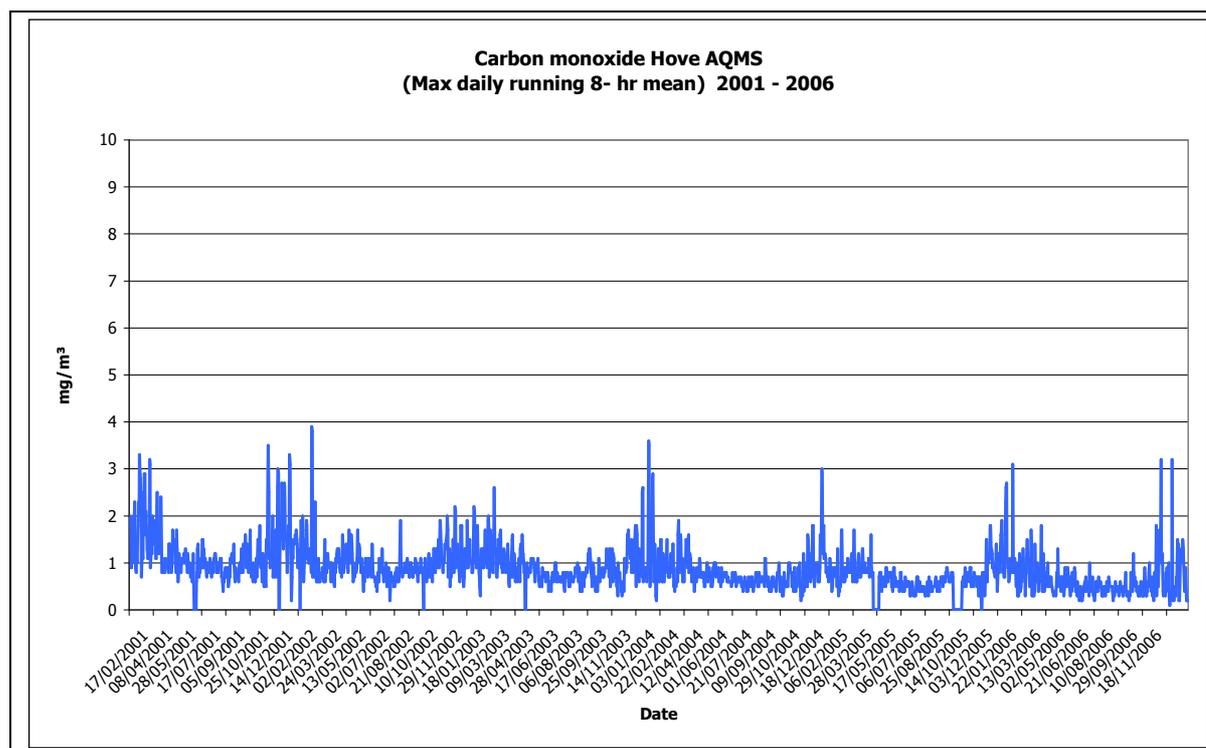
Key:

- Brighton CC/AURN - Affiliated /part-funded by Brighton CC and AURN (DEFRA)
- AURN - Automatic Urban and Rural Network(DEFRA owned AQ stations)
- E&W Sussex County C. - Mobile lab part owned by East and West Sussex County Councils
- DEFRA - UK Govt. Department for Environment and Rural Affairs

4.1 Updated data for Carbon Monoxide

Carbon monoxide is an asphyxiating pollutant that reduces the ability of blood to carry oxygen to the different organs. The main source of carbon monoxide in the UK is road transport, which accounted for 67% of total releases in 2000 (the most recent year for which estimates are available). Annual emissions of carbon monoxide have been falling steadily since the 1970s, and are expected to continue to do so. This is mainly due to improvements in vehicle technology and the fitting of catalytic converters. Projections indicated that road transport emissions would decline by a further 42% between 2000 and 2005 (LAQM.TG03).

Available monitoring data (obtained with automatic infrared analysers from Sussex Monitoring stations in Brighton and Hove) suggest that the carbon monoxide objective is unlikely to be exceeded at any location in Sussex. Data from Hove AURN station has not breached the 10mg/m³ in recent years, with the maximum daily 8 hour mean = 3.9mg/m³.



Graph 1 Hove AURN 2002-2006 carbon monoxide (CO) results

Conclusion

It is unlikely that the air quality objective for carbon monoxide will be exceeded in 2007 and future years.

4.2 Updated data for Benzene

Benzene is a known human carcinogen (cancer causing substance), and also contributes to the formation of ground-level ozone (summer smog). The main sources of benzene emissions in the UK are petrol vehicles, petrol refining, and the fuel distribution from petrol station without vapour recovery systems. National benzene concentrations have declined in recent years, mainly due to the increasing use of three-way catalytic converters and the introduction of vapour recovery systems in petrol stations (Stage 1 and 2 control).

Since January 2000, EU legislation has reduced the maximum benzene content of petrol to 1%, from a previous upper limit of 5%. The European Auto-Oil programme will further reduce emissions for cars and light-duty vehicles, and emissions of benzene from the storage and distribution of petrol (LAQM.TG03).

Although Arun District Council does not carry out any benzene monitoring, it is unlikely to have been breached in Arun District. Data from the pumped diffusion tube survey at Hove, undertaken as part of the national PAH monitoring network shows that the air quality objective would not be breached in 2006:

Site:	Hove	Hove	Hove	Hove	Hove
Year:	2002 (part year)	2003	2004	2005	2006
Units:	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Annual Average Benzene: (Annual limit value = 5 $\mu\text{g}/\text{m}^3$)	1.62	1.93	1.91	1.86	1.13

Table 2 Hove AURN 2002-2006 Benzene results

Ref: UK national air quality archive: (http://www.airquality.co.uk/archive/data_and_statistics.php)

Conclusion

It is unlikely that the air quality objective for benzene will be exceeded in 2007 and 2010.

4.3 Updated data for 1,3-Butadiene

Concentrations of 1,3-butadiene are measured at a limited number of UK national network sites. No local monitoring of 1,3-butadiene is currently being carried out in Sussex.

No industrial sources handling, storing or emitting 1,3-butadiene were identified during the first round of review and assessment as likely to give rise to exceedances of the running annual mean objective. New sources introduced into Arun District or existing sources with substantially increased emissions have not been identified. This suggests that the 1,3-butadiene objective is unlikely to be exceeded at any location in the District.

Data

Table 3 presents the monitoring results from the locations in the UK which monitor for 1,3-Butadiene.

Site Name	Annual Mean 2005 ($\mu\text{g m}^{-3}$)
Birmingham Roadside	0.07
Bristol Old Market	0.21
Leeds Centre	0.05
Leeds Roadside	0.17
Middlesbrough	0.09

Table 3: Monitoring in the UK for 1,3-Butadiene

Conclusion

It is unlikely that the air quality objective for 1,3-butadiene will be exceeded in 2007 or future years.

4.4 Updated data for Lead

There is currently no local monitoring of lead in Sussex. No industrial sources were identified during the first round of review and assessment as likely to give rise to exceedances of the annual mean objective for lead. New sources introduced into Arun District or existing sources with substantially increased emissions have not been identified.

Conclusion

It is unlikely that the air quality objective for Lead will be exceeded in 2007 and 2008.

4.5 Updated data for Nitrogen Dioxide

Nitrogen dioxide is the pollutant for which there is the most local monitoring. This is because of the availability of cheap and relatively simple monitoring equipment such as NO₂ diffusion tubes.

Arun District Council operates thirteen diffusive sampling sites (8 roadside, 5 urban background). The distribution of diffusion tubes are detailed in Appendix II. Four of the thirteen sites are also included in the national NO₂ diffusion survey. The distribution of diffusion tubes are detailed in Appendix II.

The NO₂ diffusion tubes are supplied and analysed by South Yorkshire (including former Rotherham Metropolitan Borough Council) Laboratory. The NO₂ tube preparation method used is 50% triethanolamine (TEA) in Acetone, and the tubes are exposed over a monthly period. Details of the QA/QC and analysis methods for the NO₂ diffusion tube data are given in Appendix III.

4.5.1 Bias Correction

In accordance with section 6.25 and Box 6.2 (A) of technical guidance document LAQM.TG (03), diffusion tube monitoring data must be appropriately corrected to account for any laboratory bias. Information published by Air Quality Consultants Ltd (on behalf of DEFRA) at <http://www.uwe.ac.uk/aqm/review/diffusontube300307.xls> provides bias correction factors for collocation studies involving specific laboratories. The following overall bias adjustment factors have been provided for Rotherham MBC (Rotherham MBC/South Yorkshire in 2003) laboratory:

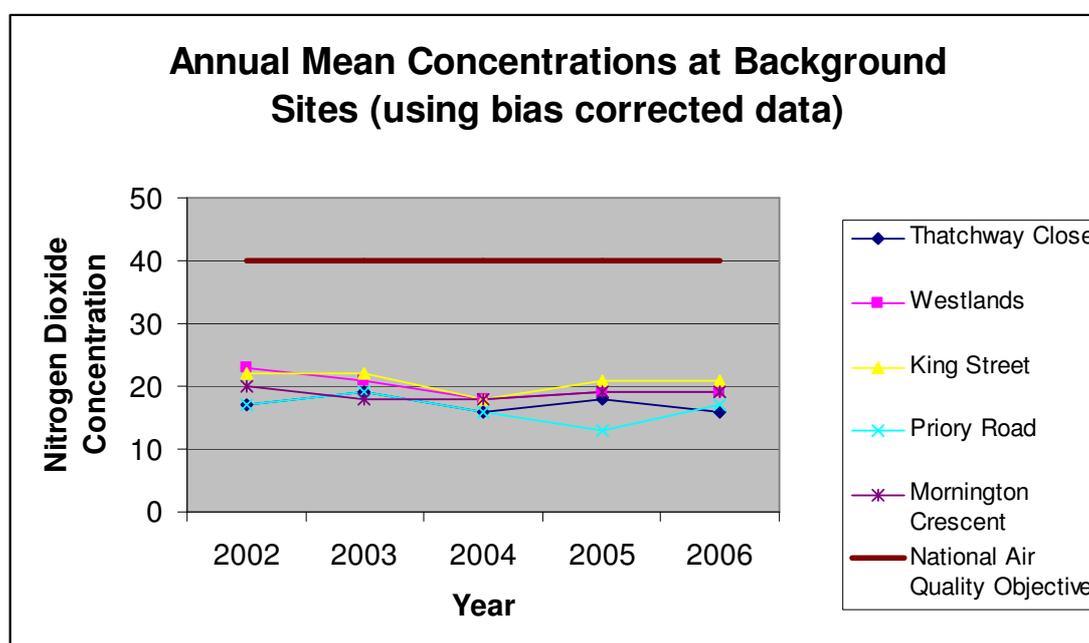
Year	Bias Adjustment Factor
2002	0.90
2003	0.90
2004	0.82
2005	0.91
2006	1.01

Arun District Council does not undertake any collocation studies and therefore the annual average monitoring data for each NO₂ tube has been corrected using the laboratory bias adjustment factors provided.

4.5.2 Monitoring Data

Year of Data	Background Sites				
	Thatchway Clo	Westlands	King St	Priory Rd	Mornington Crescent
2002	17	23	22	17	20
2003	19	21	22	19	18
2004	16	18	18	16	18
2005	18	19	21	13	19
2006	16	19	21	17	19

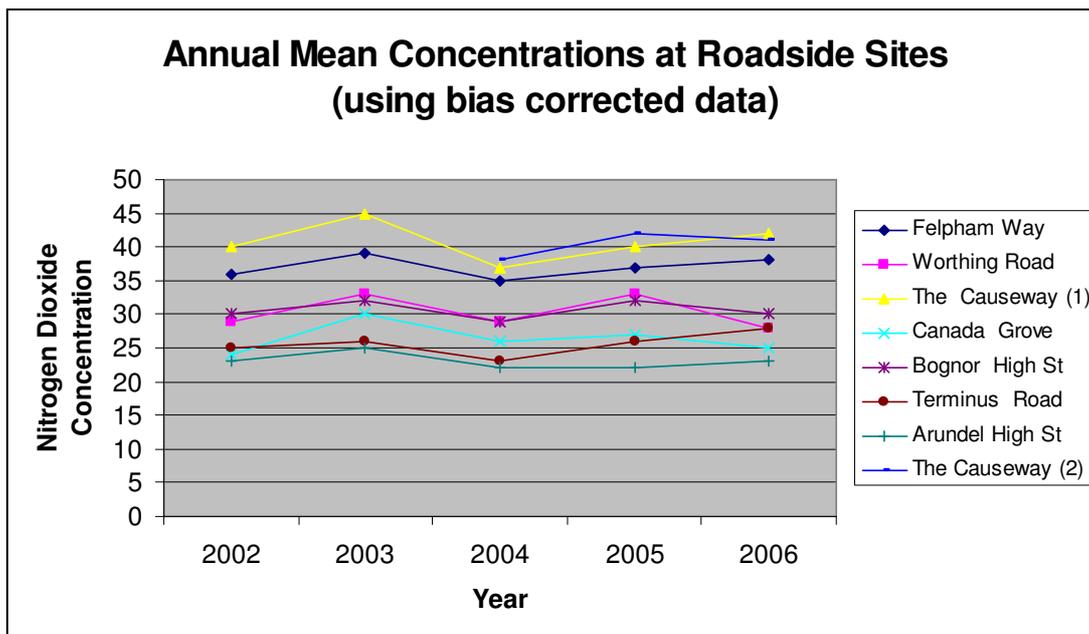
Table 4: Annual mean NO_2 concentrations at background sites (using bias corrected data ($\mu g m^{-3}$))



Graph 2: Annual mean NO_2 concentrations at background sites (using bias corrected data)

Year of Data	Roadside Sites							
	Felpham Way	Worthing Road	The Causeway	Canada Grove	Bognor High St	Terminus Road	Arundel High St	The Causeway
2002	36	29	40	24	30	25	23	NS*
2003	39	33	45	30	32	26	25	NS*
2004	35	29	37	26	29	23	22	38
2005	37	33	40	27	32	26	22	42
2006	38	28	42	25	30	28	23	41

Table 5: Annual mean NO_2 concentrations at roadside sites (using bias corrected data ($\mu g m^{-3}$)) (*NS= Not sampled)



Graph 3: Annual mean NO₂ concentrations at roadside sites (using bias corrected data)

4.5.3 Estimated Future NO₂ Concentrations

Following the procedure as set out in Boxes 6.2 and 6.7 of technical guidance document LAQM.TG(03), the bias corrected monitoring data has been adjusted to provide an estimate for the annual mean NO₂ concentration in 2008 and 2010.

Projected Year	Background Sites				
	Thatchway Close	Westlands	King St	Priory Rd	Mornington Crescent
2008	15	18	19	16	18
2010	14	16	18	14	16

Table 6: Annual mean NO₂ concentrations at background sites, estimated for 2008 and 2010 (using bias corrected data (µgm⁻³))

The results for background NO₂ concentrations in 2008 and 2010 are estimated to be well below the annual mean objective of 40µgm⁻³.

Project Year	Roadside Sites							
	Felpham Way	Worthing Road	The Causeway	Canada Grove	Bognor High St	Terminus Road	Arundel High St	The Causeway
2008	35	26	39	23	28	26	21	38
2010	22	24	36	21	26	24	20	35

Table 7. Annual Mean NO₂ Concentrations at Roadside Sites, Estimated for 2008 and 2010 (using corrected data (µgm⁻³))

The results for roadside NO₂ concentrations in 2008 and 2010 are estimated to be below the annual mean objective of 40µgm⁻³.

4.5.4 Additional Diffusion Tube at The Causeway, Arundel

After submission of Arun's Progress Report in 2004, the following comments were received from DEFRA: "It is suggested that the diffusion tube situated at the Causeway is moved to the façade of the closest building (if practicable) or an extra site included in order that the Council satisfies itself that there is no likely exceedance of the annual mean nitrogen dioxide objective at this location."

It was not possible to move the original diffusion tube to the façade of the closest building. However, an extra tube was included at The Causeway from September 2004 onwards. The average concentration for "The Causeway(2)" (calculated from the three months' available data in 2004), following bias adjustment, is 44.3µgm⁻³.

Box 2.1 of the Progress Report Guidance LAQM.PRG(03) advises that "where data are available for less than 9 months, then they should be adjusted to provide an estimate of the annual mean using the procedure set out in LAQM.TG(03)".

In accordance with LAQM.TG(03) the annual mean (Am) and period mean (Pm) of the four nearest background sites were used to calculate an adjustment factor (Ra):

Long Term Site	Annual Mean (Am) 2004	Period Mean (Pm) Aug-Dec 2004	Ratio (R)
Thatchway Close	16.07	19.13	0.840
Westlands	17.77	19.41	0.915
King Street	18.49	22.14	0.835
Priory Road	16.48	18.86	0.874

Table 8: Generation of adjustment factor for estimation of annual mean nitrogen dioxide concentrations from short-term monitoring data

The adjusted annual mean for 2004 for "The Causeway(2)" is therefore:
 $44.3 (M) \times 0.866 (Ra) = 38.4\mu\text{gm}^{-3}$

In order to get a more detailed picture of conditions at this site, a more accurate continuous NO₂ analyser was installed at The Causeway between July and October 2005, by West Sussex County Council giving hourly readings of nitrogen dioxide concentrations. Some technical problems were experienced and, as a result, less data was collected than initially expected.

All data have been ratified, extrapolated to cover a full calendar year where necessary, and projected to the end of year (2005), as indicated in the technical guidance (Box 6.5 - adjustments for short term monitoring) of the technical guidance LAQM.TQ (03). The results from this monitoring are shown in the table below:

Month in 2005	Number of days monitored	Level of nitrogen dioxide
July	6	10.9 µg/m ³
August	14	20.2 µg/m ³
September	30	19.1 µg/m ³

Table 9: Monitoring from the continuous NO₂ analyser – Arundel Causeway

The overall average for nitrogen dioxide from the above data is **23.16** µg/m³. This level is well below the objective level.

Clearly, using the results directly from the diffusion tubes, the annual mean concentration at “The Causeway” site for 2006 is just over the objective level of 40µg -3. However, section 1.20 LAQM.TG(03) states that: “it is considered appropriate to measure at the building façade to represent relevant exposure...(and) it is considered reasonable to select the façade of residential properties closest to the road as a representative location to assess exposure for pollutants with an annual mean objective”.

Furthermore, advice given in the Frequently Asked Questions section of the Air Quality Review and Assessment Website (UWE) suggests that concentrations will be slightly lower at the building façade.

Given that the distance from the façade of the nearest residential properties (1-8 Causeway Villas) to the tube located at “The Causeway(2)”, Arundel, is 8 metres it can be assumed that concentrations at this position would be even further below the objective level. As the tubes are not located at the façade of the building, the results were adjusted as detailed in the FAQ on the following website: <http://www.uwe.ac.uk/aqm/review/mfaqroad.html>. Therefore the adjusted annual mean for The Causeway for 2005 at the building facade is:

$$42 \times 0.90 = \mathbf{37.8} \text{ } \mu\text{g/m}^3$$

In view of this, together with the result obtained from assessing the continuous monitoring data above, it has been decided not to proceed to a detailed assessment.

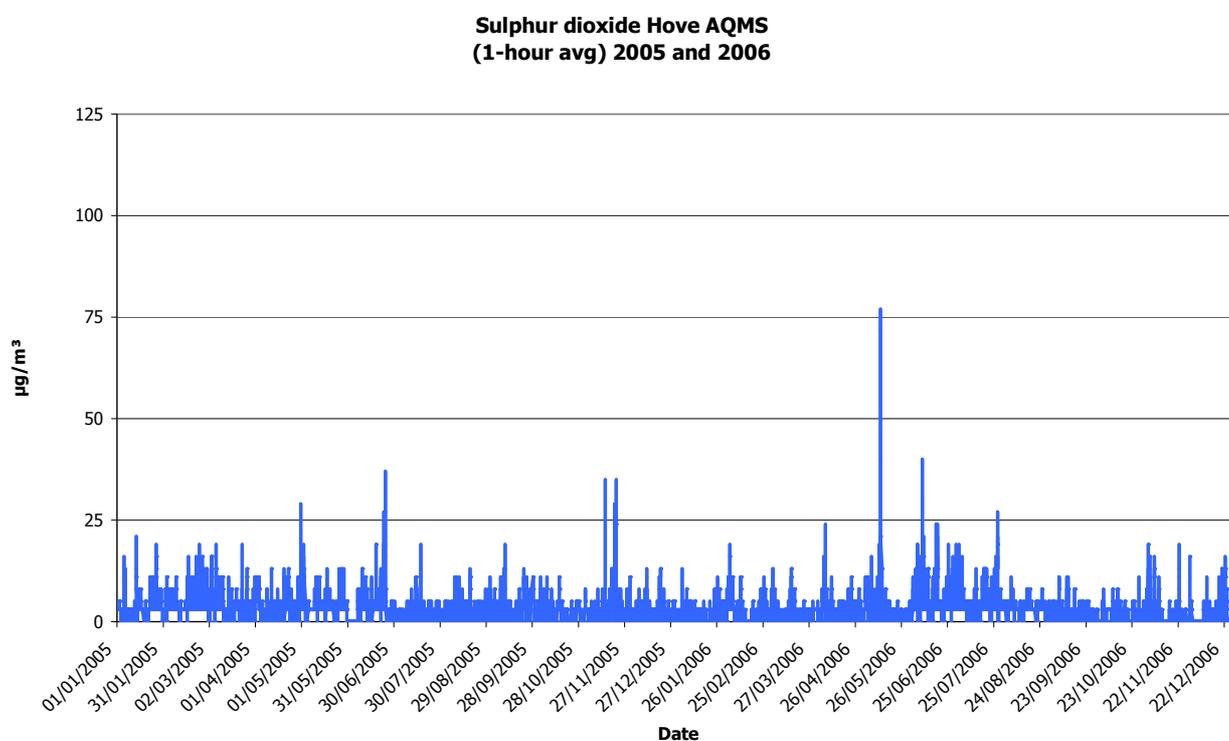
4.5.6 Conclusion

It is unlikely that the air quality objective for Nitrogen Dioxide will be exceeded in 2008 or 2010.

4.6 Updated data for Sulphur Dioxide

Sulphur dioxide is an acute respiratory irritant, hence the short averaging time for its objective. The main source of sulphur dioxide in the UK is power stations, which accounted for more than 71% of emissions in 2000. There are also significant emissions from other industrial combustion sources. Domestic sources now only account for 4% of emissions, but can be locally much more significant. Road transport currently accounts for less than 1% of emissions (LAQM.TG03).

Automatic sulphur dioxide monitoring is undertaken at two permanent stations in Sussex located in Hove (roadside) and Lullington Heath (rural). The 2005 - 06 data from the Hove AURN air quality station does not indicate any exceedance of the national objectives.



Graph 4 – Sulphur Dioxide levels measured at Hove AQMS

Large boiler plant ($>5 \text{ MW}_{\text{thermal}}$) can give rise to high short-term concentrations, with the risk that the 15-minute objective may be exceeded. These boilers have been identified (Appendix II) .

There are no significant shipping or railway locomotive emissions in Arun District. It is thus conclude that sulphur dioxide objective is unlikely to be exceeded at any location in the District.

Conclusion

As data from the Hove AURN air quality station shows Sulphur Dioxide levels well below the air quality objective, it is unlikely that the air quality objective will be exceeded in 2007 or in Arun District.

4.7 Updated data for Particulate Matter (PM₁₀)

Particulate matter is of major health concern, as it has been linked with both increased morbidity and premature mortality. There is a wide range of emission sources that contribute to PM₁₀ concentrations in the UK. Research studies have confirmed that these sources can be divided into 3 main categories (APEG, 1999): (I) *Primary particle* emissions are derived directly from combustion sources, including road traffic, power generation, industrial processes etc. (II) *Secondary particles* are formed by chemical reactions in the atmosphere, and comprise principally of sulphates and nitrates. (III) *Coarse particles* comprise of emissions from a wide range of sources, including re-suspended dusts from road traffic, construction works, mineral extraction processes, wind-blown dusts and soils, sea salt and biological particles.

Arun District Council does not carry out any monitoring for PM₁₀.

The nearest monitoring site to the Arun District is in Chichester. Chichester District Council operates an automatic (TEOM) monitor, permanently located on A27 Ring Road, Chichester (Grid Ref. E485887, N103802), giving hourly readings of PM₁₀ concentration. The obtained data have been used to estimate gravimetric concentrations, which were then ratified. The annual average for the year 2006 was 29µgm⁻³, well below the annual mean national objective of 40µgm⁻³. The number of exceedances of the 24-hour PM₁₀ objective for the same year was 7, thus below the allowed number of exceedances (35).

Chichester District Council is carrying out further monitoring and the resulting data and analysis from this will make any trend more clear.

Conclusion

The air quality objective for PM₁₀ was not exceeded in 2007 and it is unlikely that it will be exceeded in future years.

4.8 Updated data for other pollutants.

Arun District Council does not currently monitor for any other pollutants.

Arun has been working with the Sussex Air Quality Steering Group (SAQSG) to monitor ozone levels in the region. Diffusion tubes (a similar technique to that used to measure Nitrogen Dioxide), have been attached to lampposts at a site in Bognor Regis and another in Arundel. In addition to the diffusion tubes, an ozone monitor has been installed at West Beach. These were part of the Anglo-French ARMO project (<http://www.arm-ozone.org/en>)

Ozone monitoring results, available on www.sussex-air.net, show that the ozone levels at both the Arundel and Bognor Regis sites are higher than the average shown in Sussex. As ozone is not a controlled pollutant, there are no statutory levels to be adhered to.

5 New Local Developments

New Developments

Arun District has had no new major developments that may have an impact on local air quality.

A future development has gained outline planning permission (Autumn 2006). This development is planned for the west of the District to include approximately 1500 new houses north of Bognor Regis and Felpham and a relief road around Bognor Regis. An Environmental Impact Assessment carried out as part of the planning application concluded that *"no exceedances of the Air Quality Strategy objectives will occur at existing potentially sensitive receivers"*.

Industrial Sources

Industrial sources are currently controlled under the Environmental Protection Act 1990, and are classified into either Part A (large industries such as power stations and chemical works) or Part B/A2 processes (such as crematoria, petrol stations, quarries, etc.) for guidance and control. There have been no new industrial sources since the last Updating and Screening Assessment (USA) 2005.

6 Local Air Quality Strategy

The Sussex Air Quality Strategy (Draft Sept. 2003) – Framework for Action, has been formulated as a framework document from which members of the Sussex Air Quality Steering Group (SAQSG) can integrate into their own Local Air Quality Strategy.

From the SAQSG Air Quality Strategy (Sept 2003):

"The National Air Quality Strategy recognises that every local authority can make a contribution to continued improvements in air quality by the development of their own strategies. By developing and implementing local air quality strategies an integrated approach to air quality can be obtained.

By providing an air quality template, each authority can adopt it and modify it according to their authority circumstances and role. Much of the template will be common to many authorities in Sussex. However, vital to ensuring a consistent approach is maintained in the aim and purpose of every authority's strategy, all agencies participating in Sussex Air Quality Steering Group has agreed to the Guiding Principle and Aims of improving air quality in Sussex."

Arun District Council is in the process of producing its own Local Air Quality Strategy based on the above framework.

7 Planning and Policies

The Arun District Local Plan 2003 forms a statement of Arun District Council's planning policies, which will be used as a basis for decision making on planning applications. The Plan covers the period from 1996 to 2011 and its key aim is to apply the principles of sustainable development in assessing development proposals, striking the balance between the need for development and the protection of scarce resources. The Plan also serves to translate the land use elements of the Council's Community Strategy, "Our Kind of Place", into policies and proposals. The Core Strategy of the Local Development Framework will be published for consultation late in 2007, and should be adopted in July/August 2009. Two Development Plan Documents, Sustainable Communication and the Gypsy and Traveller document should be adopted in 2010. There are a number of general policies within the current Local Plan that may affect local air quality.

- **POLICY GEN4 Location and Travel Demand**

When considering proposals for new development, consideration will be given to the effect the proposals will have on demand for transport. Planning permission will be granted for new development, provided that:-

- (i) it is located so as to minimise the demand for travel;
- (ii) it does not materially add to existing road congestion and air pollution; and appropriate provision is made for safe and convenient access by public transport, cyclists and pedestrians.

Before granting planning permission, the Local Planning Authority will need to be satisfied that any identified potential travel problems arising from a proposal will be resolved.

- **POLICY GEN14 Public Transport**

The Council will support the provision of comprehensive public transport services throughout the District, and encourage improvements to be made to services wherever possible. Where appropriate, new development will be required to make provision for public transport facilities.

Where new development can only take place with improvements to public transport services, or such improvements would be likely to influence desirable travel patterns, the Local Planning Authority will seek contributions towards the cost of improvements.

- **POLICY GEN34 Air Pollution**

Development that contributes to air pollution through dust, smell, fumes, smoke, heat, radiation, gases, steam or other forms of pollution will not be permitted unless the Council decides that the health, safety and amenity of users of the site or surrounding land is not put at risk and the quality of the environment would not be damaged or put at risk.

8 Local Transport Plans and Strategies

West Sussex County Council (WSCC) is the Highways Authority for West Sussex and is responsible for all roads, other than trunk roads. WSCC published its first Local Transport Plan (LTP) in 2000 for the period from April 2001 to 2006. It's second LTP, a new ten year plan covering the period 2006 to 2016 was approved in March 2006 (LTP2).

LTP2 is the second cycle of the Local Transport Plans which transport authorities must submit to government on strategic transport planning issues related to their area. Guidance documents are provided by government and outline priorities, one of which is Air Quality, especially in relation to AQMA's.

The Plan's main objectives are to:

- Reduce congestion & pollution;
- Improve road & personal safety;
- Improve accessibility for our residents to key services;
- Improve overall quality of life in West Sussex

The LTP is designed to integrate transport planning with land use planning, health and social needs, which includes air quality. It also explains how air quality considerations are taken account of in the wider plan and in the assessment of individual transport schemes.

The strategy will impact in particular upon the transport plan objectives of reducing congestion and growth in unsustainable travel, improving air quality, reducing the impact of expected climate change and reducing the environmental impact of undertaking all aspects of transport provision and maintenance.

Key targets include:

- Continue to work closely with all councils, including those that are neighbours to West Sussex, and with the primary health care trusts, the Environment Agency, Highways Agency, Sussex and Brighton universities and the Sussex Air Quality Partnership;
- Assist district councils and surrounding counties in their air quality assessments;
- Promote the provision of alternative fuels on Garage forecourts across West Sussex, primarily LPG but also CNG, LNG, and biofuels. Look at

provision of public electric recharging points if electric vehicle use is to be promoted;

- Continue with our air quality forecasting and warning system to inform the public and improve their awareness of air quality issues and less polluting means of travel;
- Consider use of Low Emission Zones (LEZs) as part of our developing policies on environmental access controls for town centres, which will be geared to local circumstances,;

Glossary

AADT	Annual Average Daily Traffic (vehicles per day)
AEOLIUSQ	Screening model for street canyons (Met Office)
APEG	Airborne Particles Expert Group
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
CO	Carbon monoxide
COMEAP	Committee on the Medical Effects of Air Pollutants
DA	Detailed Assessment
DEFRA	Department for Environment Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges Screening Model
ESCC	East Sussex County Council
HDV	Heavy Duty Vehicles
LTP2	Local Transport Plan (Round 2, 2006 – 2011))
LAQM	Local Air Quality Management
mg/m ³	Milligrams of the pollutant per cubic meter of air
µg/m ³	Micrograms of the pollutant per cubic meter of air
ppb	Parts per billion
ppm	Parts per million
NAEI	National Atmospheric Emissions Inventory
NAQS	National Air Quality Strategy
NO	Nitrogen monoxide
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
PM ₁₀	Particles with diameter less than 10µm
QA/QC	Quality Assurance / Quality Control
R&A	Review and Assessment
SAQSG	Sussex Air Quality Steering Group
SO ₂	Sulphur dioxide
TEOM	Tapered Element Oscillating Microbalance
USA	Updating and Screening Assessment
WSSC	West Sussex County Council

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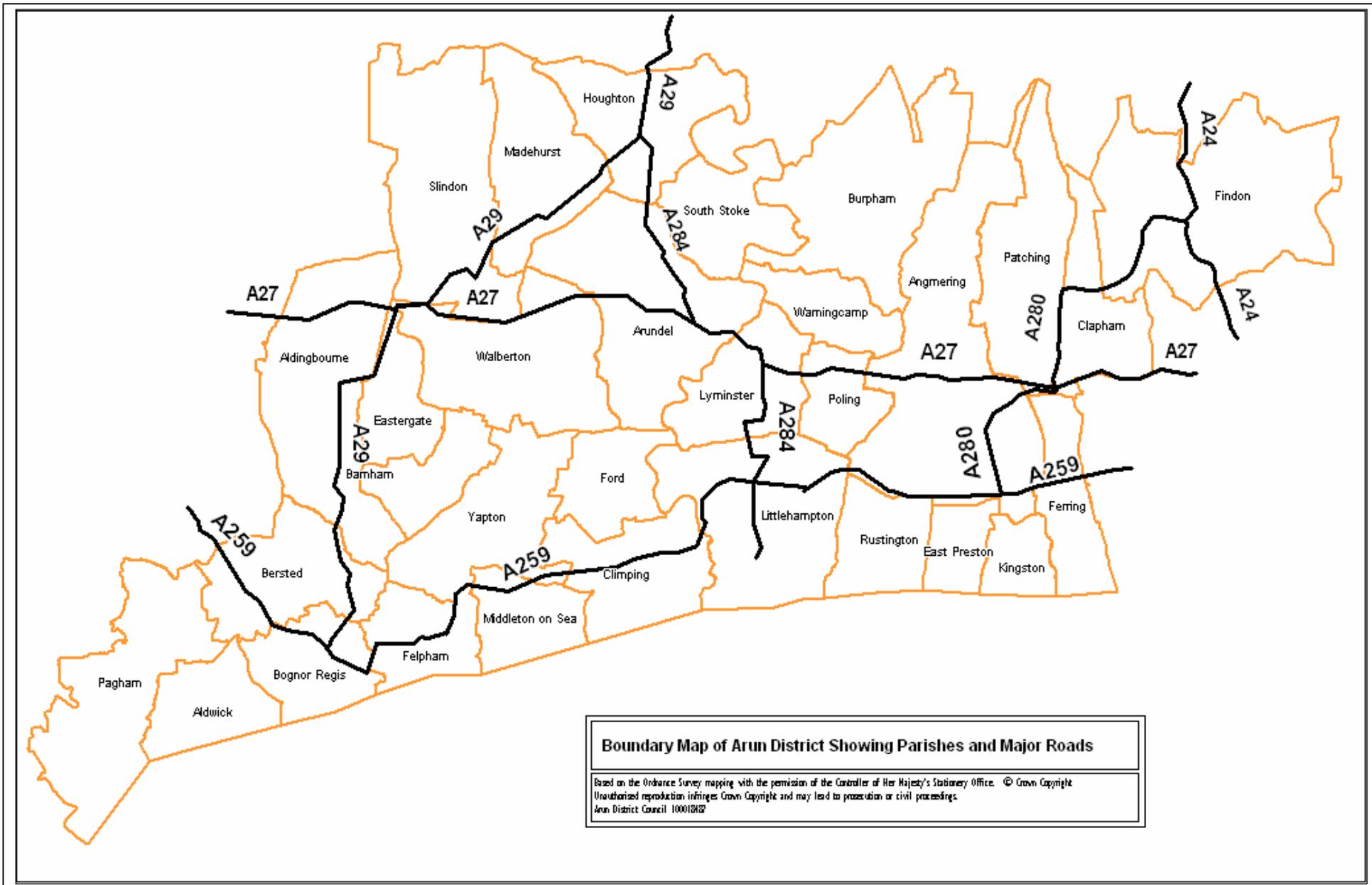
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The Environment Act (1995)

The Environmental Protection Act (1990)

Appendix I: District Boundaries



Boundary Map of Arun District Showing Parishes and Major Roads

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Appendix II: New and Changed Developments

Part A, A2 or B Processes:

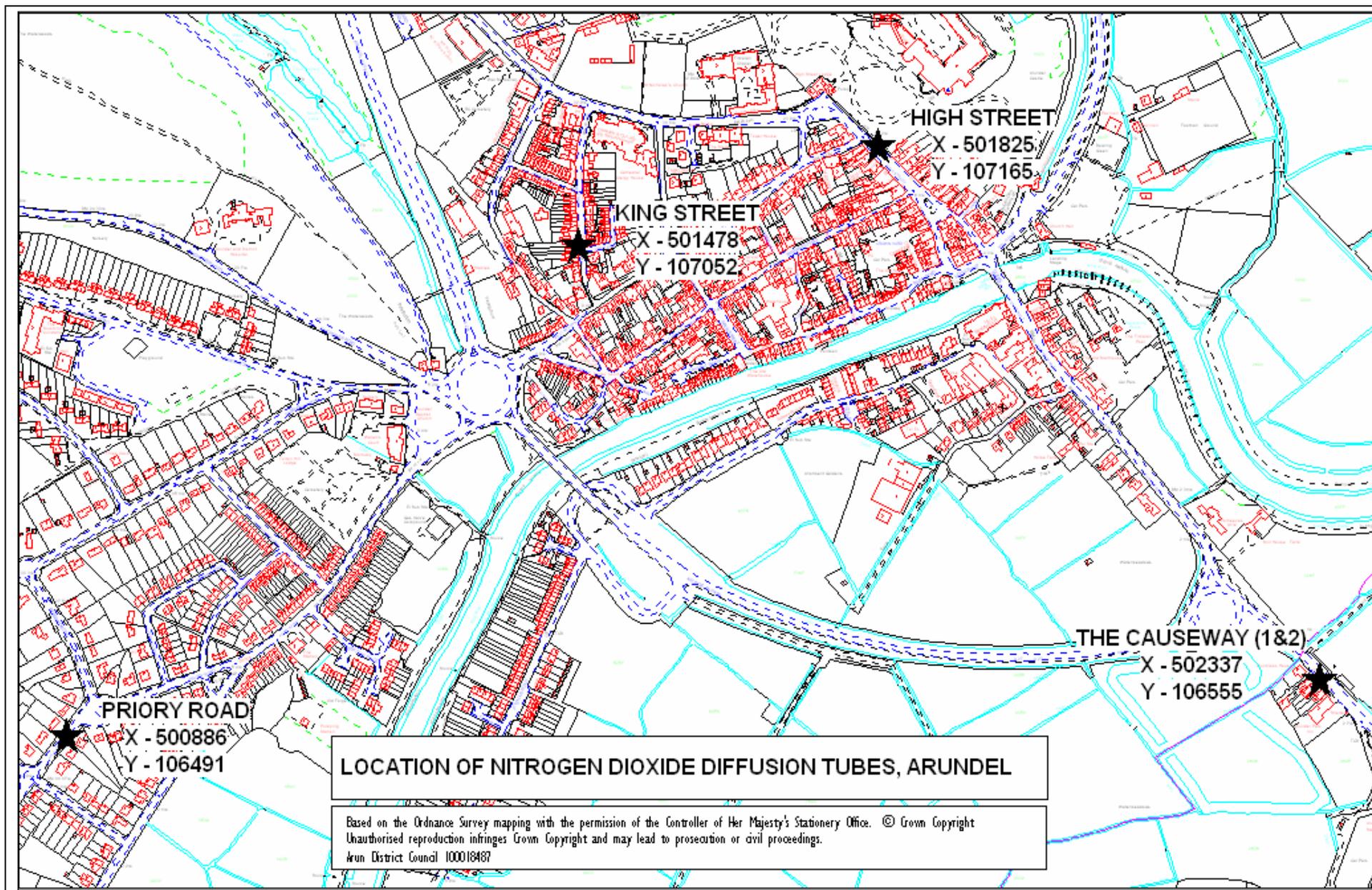
There are no new industrial processes in Arun District.

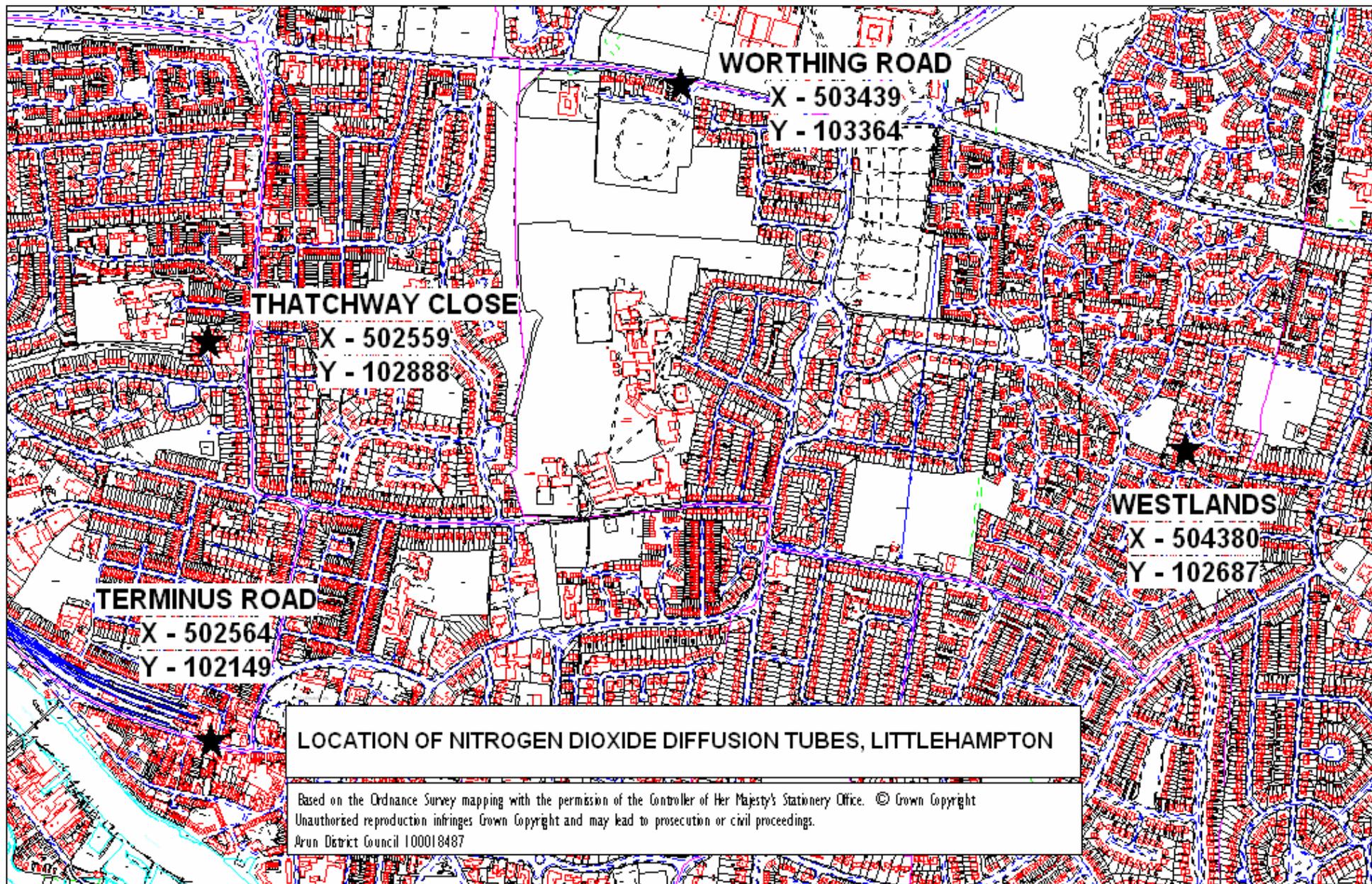
Recent traffic data:

No recent traffic counts have been undertaken. It is intended that traffic counts will be undertaken before the next Updating and Screening assessment in 2009.

NOx diffusion tube location details:

Shown on following pages.





WORTHING ROAD

X - 503439

Y - 103364

THATCHWAY CLOSE

X - 502559

Y - 102888

WESTLANDS

X - 504380

Y - 102687

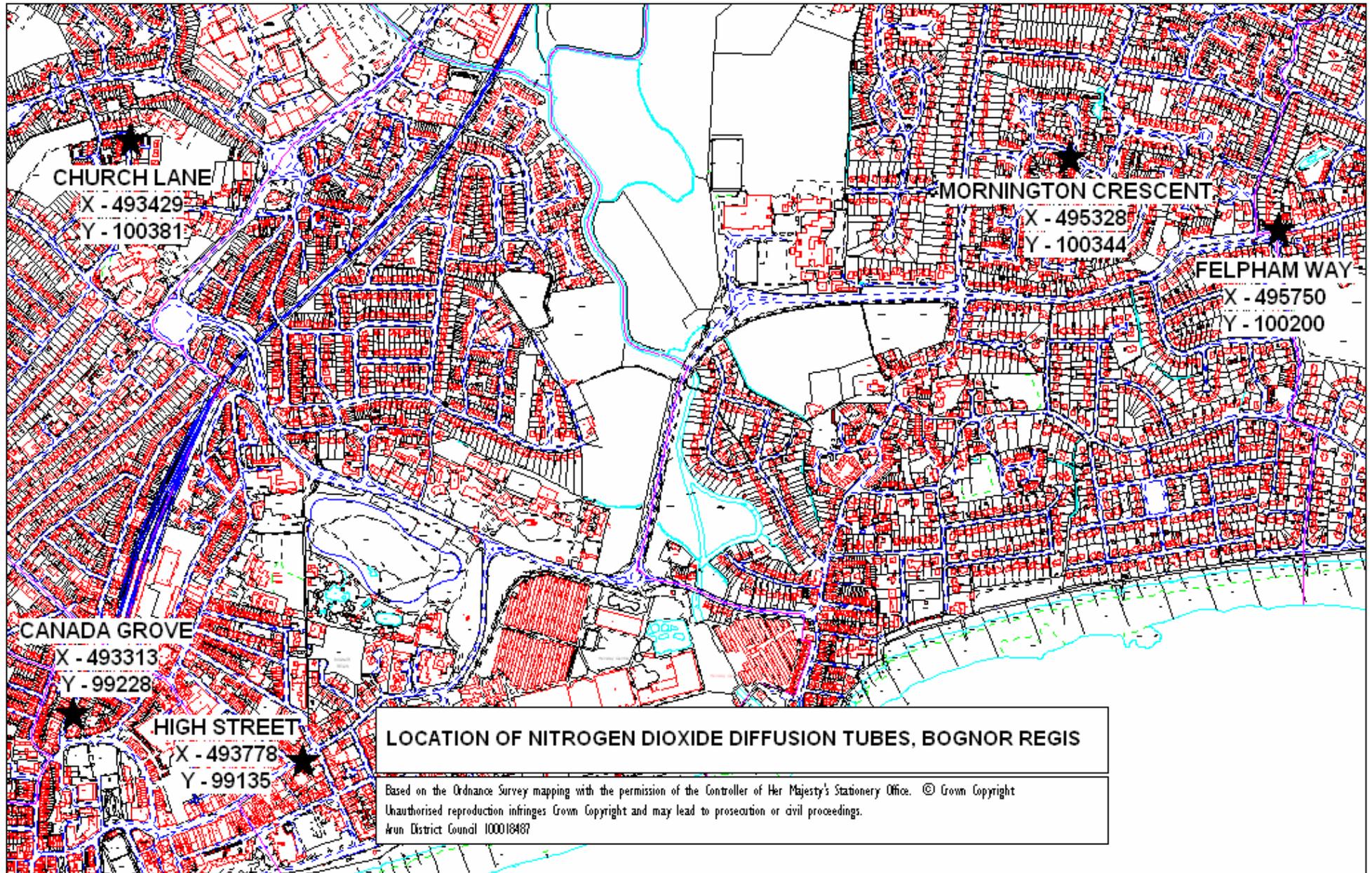
TERMINUS ROAD

X - 502564

Y - 102149

LOCATION OF NITROGEN DIOXIDE DIFFUSION TUBES, LITTLEHAMPTON

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CHURCH LANE

X - 493429

Y - 100381

MORNINGTON CRESCENT

X - 495328

Y - 100344

FELPHAM WAY

X - 495750

Y - 100200

CANADA GROVE

X - 493313

Y - 99228

HIGH STREET

X - 493778

Y - 99135

LOCATION OF NITROGEN DIOXIDE DIFFUSION TUBES, BOGNOR REGIS

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Appendix III: Monitoring Data – QA/QC and ratification

All diffusive monitoring data have been ratified following the methods described in LAQM.TG(03). A quality assurance / quality control (QA/QC) programme including field duplicates and blanks, and instrument calibration with standard gases has been followed (AEAT, 2000).

The NO₂ diffusion tube analysis was carried out at South Yorkshire Laboratory. The NO₂ tube preparation method used is 50% triethanolamine (TEA) in acetone. Data from the NO₂ diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location data-base as produced by University of West of England (UWE) on behalf of DEFRA.

(<http://www.uwe.ac.uk/aqm/review/no2dtbiasdatabase.xls>)