



# 2012 Air Quality Updating and Screening Assessment for Arun District Council

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

April 2012

<b>Local Authority Officer</b>	Graham Evans
<b>Department</b>	Environmental Health Department
<b>Address</b>	Arun Civic Centre Maltravers Road Littlehampton West Sussex BN17 5LF
<b>Telephone</b>	01903 737694
<b>e-mail</b>	graham.evans@arun.gov.uk
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## Executive Summary

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 Regulations<sup>1</sup>, 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 location 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.

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 Progress Reports (PR) of local air quality by the end of April 2010, and by the end of April 2011, and a further USA by the end of April 2012.

This Updating and Screening Assessment identifies those matters that have changed since the previous round was completed, and which now require further assessment. 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 Updating and Screening Assessment provides a summary of new monitoring data; new objectives; new sources or significant changes to existing sources; and other local changes that might affect air quality within Arun District.

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<sup>1</sup> Air Quality Regulations for England (2000; Amendment Regulations 2002)

It is concluded that air quality objectives were not exceeded in 2011, nor is there a risk of exceedance in 2012, Arun District Council will not therefore be required to undertake any Detailed Assessments of air quality in 2013.

**Arun District Council will undertake a further LAQM Progress Report in 2013.**

# Table of contents

<b>1</b>	<b>Introduction .....</b>	<b>7</b>
1.1	Description of Local Authority Area .....	7
1.2	Purpose of Report.....	8
1.3	Air Quality Objectives .....	8
1.4	Summary of Previous Review and Assessments.....	10
<b>2</b>	<b>New Monitoring Data .....</b>	<b>14</b>
2.1	Summary of Monitoring Undertaken.....	14
2.1.1	Automatic Monitoring Sites .....	14
2.1.2	Non-Automatic Monitoring Sites .....	16
2.2	Comparison of Monitoring Results with AQ Objectives.....	17
2.2.1	Nitrogen Dioxide .....	17
2.2.2	PM <sub>10</sub> .....	21
2.2.3	Sulphur Dioxide.....	21
2.2.4	Benzene.....	21
2.2.5	Other pollutants monitored .....	21
2.2.6	Summary of Compliance with AQS Objectives .....	21
<b>3</b>	<b>Road Traffic Sources .....</b>	<b>22</b>
3.1	Narrow Congested Streets with Residential Properties Close to the Kerb .....	22
3.2	Busy Streets Where People May Spend 1-hour or More Close to Traffic.....	22
3.3	Roads with a High Flow of Buses and/or HGVs. ....	23
3.4	Junctions.....	23
3.5	New Roads Constructed or Proposed Since the Last Round of Review and Assessment 24	
3.6	Roads with Significantly Changed Traffic Flows.....	25
3.7	Bus and Coach Stations .....	26
<b>4</b>	<b>Other Transport Sources.....</b>	<b>27</b>
4.1	Airports.....	27
4.2	Railways (Diesel and Steam Trains) .....	27
4.2.1	Stationary Trains.....	27
4.2.2	Moving Trains .....	27
4.3	Ports (Shipping) .....	27
<b>5</b>	<b>Industrial Sources.....</b>	<b>29</b>
5.1	Industrial Installations .....	29
5.1.1	New or Proposed Installations for which an Air Quality Assessment has been Carried Out	29
5.1.2	Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced .....	29
5.1.3	New or Significantly Changed Installations with No Previous Air Quality Assessment...	30

5.2	Major Fuel (Petrol) Storage Depots .....	30
5.3	Petrol Stations.....	31
5.4	Poultry Farms.....	31
<b>6</b>	<b>Commercial and Domestic Sources .....</b>	<b>32</b>
6.1	Biomass Combustion – Individual Installations .....	32
6.2	Biomass Combustion – Combined Impacts.....	32
6.3	Domestic Solid-Fuel Burning .....	33
<b>7</b>	<b>Fugitive or Uncontrolled Sources.....</b>	<b>34</b>
<b>8</b>	<b>Conclusions and Proposed Actions.....</b>	<b>35</b>
8.1	Conclusions from New Monitoring Data .....	35
8.2	Conclusions from Assessment of Sources .....	36
8.3	Proposed Actions.....	37
<b>9</b>	<b>References.....</b>	<b>38</b>

**List of Tables**

- Table 1.1: Air Quality Objectives included in Regulations for the purpose of LAQM in England
- Table 2.1: Sussex air quality monitoring stations and pollutants monitored (2011).
- Table 2.2: Details of Non- Automatic Monitoring Sites
- Table 2.3: Results of nitrogen dioxide diffusion tubes

**List of Figures**

- Figure 1: Arun District
- Figure 2.1: Trends in Annual Mean Nitrogen Dioxide Concentrations (2004-2011) measured at Background Diffusion Tube Monitoring Sites
- Figure 2.2: Trends in Annual Mean Nitrogen Dioxide Concentrations (2004-2011) measured at Roadside Diffusion Tube Monitoring Site

**Appendices**

Appendix A: QA/QC Data

Appendix B: Location Maps

Appendix C: Industrial Sources

Appendix D: Estimation of annual mean concentration from short-term monitoring data

Appendix E: Roads with Significantly Changed Traffic Flows

# 1 Introduction

## 1.1 Description of Local Authority Area

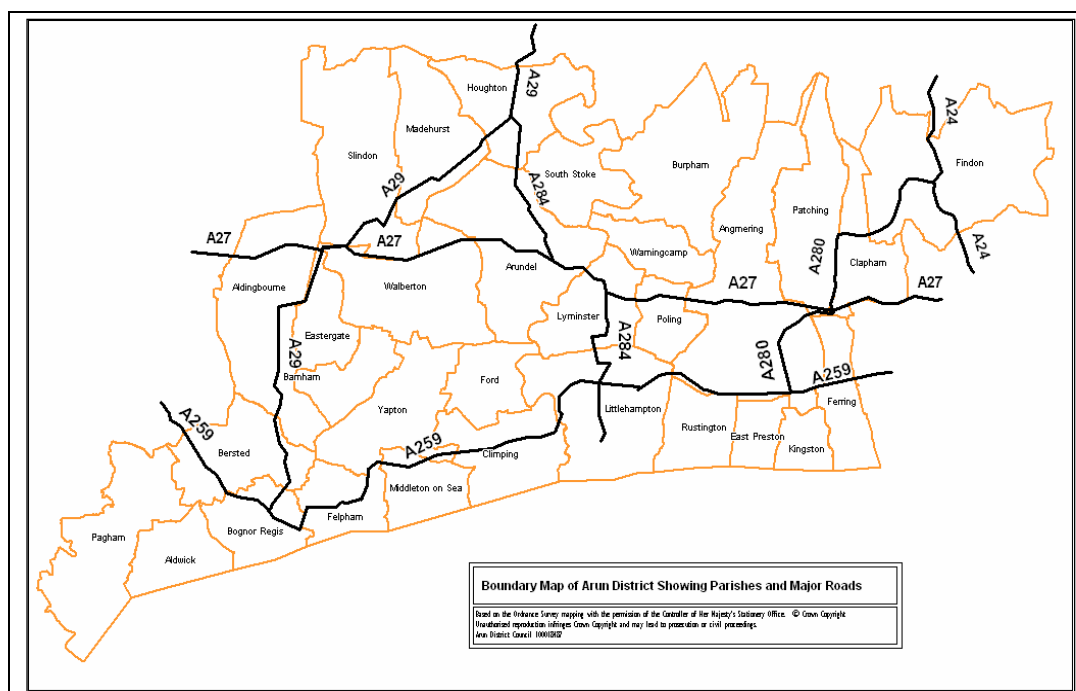
Arun District is a mixed urban / rural area covering 85 square miles, and has a current estimated population of just over 150,000. Littlehampton and Bognor Regis are the main urban centres and the principle administrative and commercial centres within the district.

Arun District is served by transport links to London, Gatwick Airport, the M25, the coast and Europe. Principle east/west routes are the A27 and A259, 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.

Figure 1. Shows the Arun District boundaries, parishes and main roads.

**Figure 1: Arun District**





## 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

## 1.3 Air Quality Objectives

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

**Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010

<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
<b>Nitrogen dioxide</b>	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b>	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
<b>Sulphur dioxide</b>	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

### Stage I, II and III

Arun District Council completed its stage I assessment in December 1998 and identified a number of pollutant sources within the district requiring further assessment. Further stage II and III assessments followed.

### Road sources

Advanced modelling was undertaken using the BREEZE ROADS model which incorporates emissions, traffic and meteorological data and provides estimates for both moving and idling vehicles. Predicted NO<sub>2</sub> concentrations for 2005 were found to be less than the required air quality objective, **so it was not necessary to declare an Air Quality Management Area (AQMA).**

### Industrial sources

The contribution of SO<sub>2</sub> and PM<sub>10</sub> from the Tarmac (Southern) Ltd., (previously Lafarge Redland Ltd.), Roadstone Coating Plant stack in Littlehampton was estimated using the GSS Environment Agency model, incorporating geographical and engineering data. When this value was added to the predicted background concentration, the total SO<sub>2</sub> concentration for 2004/2005 was found to be below the air quality objectives set for SO<sub>2</sub>. Therefore no further assessment was needed. However, for PM<sub>10</sub> the predicted total 2004 concentration was found to be within 5 mg/m<sup>3</sup> of the annual mean air quality objective, so advanced modelling was undertaken to confirm whether the objective would be met by 2004. The advanced AERMOD model results were of similar concentration to those from the GSS model and therefore it was decided not to proceed further.

To conclude, all areas identified as being of possible concern from the Stage I review and assessment were predicted to meet the necessary air quality objectives by the

target year. **Therefore, it was not necessary for this authority to declare any Air Quality Management Areas within the Arun District.**

### **2003 Updating and Screening Assessment**

In 2003, an Updating and Screening Assessment (USA) was undertaken to account for changes to air quality objectives, monitoring data and pollutant sources since the Review and Assessment. The USA did not identify any changes to local air quality which would lead to a risk of any of the air quality objectives being exceeded.

**Therefore no further detailed assessment was required.**

### **2004 Progress Report**

The 2004 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

### **2005 Progress Report**

The 2005 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

### **2006 Updating and Screening Assessment**

The 2006 Updating and Screening Assessment (USA) was undertaken to review air quality and identify new likely sources of pollution in the district. The assessment included looking at further data from the monitoring sites, assessments for congested roads, junctions, busy streets, roads with high HGV and bus volumes, as well as new roads, bus stations, new and changed emissions from industrial sources.

The 2006 USA did not identify any changes to local air quality which would lead to a risk of any of the air quality objectives being exceeded. **Therefore no further detailed assessment was required.**

### **2007 Progress Report**

The 2007 Progress Report provided a summary of all available monitoring data, indicating monitored pollutants and specific locations within Arun District. It identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

### **2008 Progress Report**

The 2008 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

### **2009 Updating and Screening Assessment**

The 2009 Updating and Screening Assessment (USA) reviewed data on measurements of air pollutants in the district and compared these to the national air quality objectives for human health. In addition the report reviewed any new or existing potential sources of pollution and has assessed their potential impacts on air quality for the citizens of the district.

The 2009 USA did not identify any changes to local air quality which would lead to a risk of any of the air quality objectives being exceeded. **Therefore no further detailed assessment was required.**

### **2010 Progress Report**

The 2010 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

### **2011 Progress Report**

The 2011 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

## 2 New Monitoring Data

### 2.1 Summary of Monitoring Undertaken

#### 2.1.1 Automatic Monitoring Sites

Arun District Council has no automatic monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

#### Monitoring of air quality across Sussex.

Arun District Council is a member of the Sussex Air Quality Partnership (Sussex Air) which benefits from the co-ordinated monitoring of air pollutants across the region. The Sussex Air Quality Monitoring Network is managed and co-ordinated by King's College London ERG, on behalf of Sussex-air and they provide data calibration and ratification of results.

**Table 2.1: Sussex air quality monitoring stations and pollutants monitored (2011).**

	<b>Authority</b>	<b>Location</b>	<b>Pollutant</b>
1	Adur	Shoreham High St	NOx
2	Brighton & Hove/AURN	Hove Roadside	NOx, O3 ,
3	Brighton & Hove CC	Beaconsfield Road (MAQMU)	NOx, PM10 (Teom)
4	Brighton & Hove CC	Stanmer Park	O3
5	Chichester D.C.	A27 Ring Road	NOx, O3, PM10(grav)
6	Chichester D.C.	Lodsworth	NOx, O3, PM10
7	Chichester D.C.	Orchard Street, Chichester	NOx
8	Crawley B.C.	East Gatwick	NOx
9	Eastbourne B.C.	Devonshire Park	NOx, O3, PM10
10	Eastbourne/AURN	Willingdon Trees	NOx, PM10, PM2.5
11	Hastings B.C.	Bulverhythe (A259)	NOx, PM10
12	Horsham D.C.	Cowfold	NOx
13	Horsham D.C.	Park Way, Horsham	NOx, PM10
14	Horsham/AURN	Storrington	NOx, PM10, PM2.5
15	Lewes D.C.	Denton School, Newhaven	NOx, O3, PM10, PM2.5
16	Lewes D.C.	Fisher Street, Lewes	NOx, PM10
17	Rother D.C	Rye Harbour	O3
18	Rother D.C.	Bexhill (A259)	NOx, PM10
19	Worthing B.C.	Grove Lodge, A27	NOx
20	Wealden D.C.	Isfield	O3
21	WSCC/Sussex Air.	Mobile AQMS	PM10, NOx, CO

	<b>Authority</b>	<b>Location</b>	<b>Pollutant</b>
22	DEFRA - AURN	Preston Park, Brighton	NO <sub>x</sub> , O <sub>3</sub> , PM <sub>2.5</sub> (partisol)
23	DEFRA - AURN	Lullington Heath, Wealden	NO <sub>x</sub> , O <sub>3</sub> , SO <sub>2</sub>

**Key:**

- CO - carbon monoxide
- NO<sub>x</sub> - oxides of nitrogen (includes NO<sub>2</sub> nitrogen dioxide)
- O<sub>3</sub> - ozone
- PM<sub>10</sub> - particles less than 10 microns
- PM<sub>2.5</sub> - particles less than 2.5 microns
- SO<sub>2</sub> - sulphur dioxide



## 2.1.2 Non-Automatic Monitoring Sites

Arun District Council undertakes monitoring with non-automatic methods using nitrogen dioxide (NO<sub>2</sub>) diffusion tubes in various locations across the district. There are no AQMA's in Arun District. Site location maps are provided in Appendix B: Location Maps.

**Table 2.2 Details of Non- Automatic Monitoring Sites**

Site Name	Local	Site Type	OS Grid Ref	NO <sub>2</sub>	Relevant Exposure ?	Distance to kerb of nearest road	Worst-case Location?
BR High Street	Bognor	Urban Roadside	X 493778 Y 099135	NO <sub>2</sub>	No	1m	N
Church Lane	Bognor	Urban Backgrd	X 493429 Y 100381	NO <sub>2</sub>	No	N/A	Y
Mornington Crescent	Bognor	Urban Backgrd	X 495328 Y 100344	NO <sub>2</sub>	No	N/A	N
Canada Grove	Bognor	Urban Roadside	X 493313 Y 099228	NO <sub>2</sub>	No	1 m	Y
Terminus Road	Little'ton	Urban Roadside	X 502564 Y 102149	NO <sub>2</sub>	No	1 m	Y
Worthing Road	Little'ton	Urban Roadside	X 503439 Y 103364	NO <sub>2</sub>	No	1 m	Y
Thatchway Close	Little'ton	Urban Backgrd	X 502559 Y 102888	NO <sub>2</sub>	No	N/A	N
Westlands	Little'ton	Urban Backgrd	X 504380 Y 102687	NO <sub>2</sub>	No	N/A	N
Arundel High Street	Arundel	Urban Roadside	X 501825 Y 107165	NO <sub>2</sub>	No	1 m	N
The Causeway	Arundel	Rural Roadside	X 502337 Y 106555	NO <sub>2</sub>	Yes (8 m)	1 m	Y
King Street	Arundel	Urban Backgrd	X 501478 Y 107052	NO <sub>2</sub>	No	N/A	N
Priory Road	Arundel	Urban Backgrd	X 500886 Y 106491	NO <sub>2</sub>	No	N/A	N
A259 Felpham Way (tube relocated 2011)	Bognor	Urban Roadside	X 495750 Y 100200	NO <sub>2</sub>	Yes (9.5m)	1.35m	N
A259 Flansham Lane (from 2011)	Bognor	Urban Roadside	X496168 Y100384	NO <sub>2</sub>	Yes (1m)	1.5m	Y
The Causeway 2	Arundel	Rural Roadside	X 502337 Y 106555	NO <sub>2</sub>	Yes (8 m)	1 m	Y
The Causeway (Façade)	Arundel	Rural Roadside	X 502337 Y 106555	NO <sub>2</sub>	Yes	9m	Y
Westergate Level Crossing	W'gate	Rural Roadside	X493762 Y104338	NO <sub>2</sub>	Yes (20m)	1m	N

**Key:**

Little'ton - Littlehampton

Arun District Council sub-contracts the supply and analysis of the NO<sub>2</sub> diffusion tubes with South Yorkshire Air Quality Samplers (SYAQS) – previously South Yorkshire Laboratory.

The NO<sub>2</sub> tube preparation method used is 50% triethanolamine (TEA) in acetone.

The South Yorkshire Laboratory was on the working group and follows the procedures set out in the Harmonisation Practical Guidance.

No co-location study has been undertaken in the district or in a neighbouring authority.

Data from the NO<sub>2</sub> diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location data-base as collated by DEFRA Local Air Quality Management Helpdesk.

The bias adjustment factor for the South Yorkshire Air Quality Samplers (SYAQS) in 2011 is 0.79.

South Yorkshire Air Quality Samplers participate in the Workplace Analysis Scheme for Proficiency (WASP) and for the period April 2010 – December 2011 100% of results submitted were subsequently determined to be “satisfactory”.

## **2.2 Comparison of Monitoring Results with AQ Objectives**

**Arun District Council monitoring results have shown that there has been no measured exceedance of the UK air quality objectives in 2011.**

### **2.2.1 Nitrogen Dioxide**

Arun District Council measures nitrogen dioxide using diffusion tubes to provide annual averaged (bias corrected) concentrations within the district.

No (diffusion tube) measured location in the district, exceeded the annual mean concentration limit of 40 µg/m<sup>3</sup> in 2010. Trends show that at all roadside sites concentrations have decreased in 2011 from 2010, concentrations are the lowest since nitrogen dioxide diffusion tube monitoring commenced in 2004.

One location (The Causeway, Arundel) has marginally exceeded the limit in previous years. This location has two (duplicate) co-located nitrogen dioxide diffusion tubes. The averaged annual measured concentration for both diffusion tubes at the Causeway has fallen from  $39.0\mu\text{g}/\text{m}^3$  in 2010 to  $34.0\mu\text{g}/\text{m}^3$  in 2011. The measurement location is adjacent (within 1.0m) of the kerb A27.

There is a relevant location of exposure (a house) a further 8.0m away from the road. When the 2010 measured concentration was re-calculated back to the closest location of relevant public exposure, the result of this calculation showed an annual mean concentration of  $29.9\mu\text{g}/\text{m}^3$ . As advised in the Appraisal Report in respect of the 2010 Progress Report a further diffusion tube was deployed at the nearest sensitive receptor location for the latter half of 2011. The annualised average measured concentration for this period is  $19.2\mu\text{g}/\text{m}^3$ .

A further location (A259, Felpham Way, Bognor Regis) was marginally below the annual mean concentration limit in 2010, the trend over the previous three years showing a steady increase. The nearest relevant location of exposure in the vicinity of the diffusion tube was 9.5m away from the road consequently the tube was relocated at the start of 2011 to a position within 1m of a relevant location (A259, Flansham Lane, Bognor Regis), 450m east on the same road. The measured annual mean concentration at the relocated position for 2011 was  $29.0\mu\text{g}/\text{m}^3$ .

At the request of a concerned local resident a diffusion tube was temporarily located at a position in the vicinity of a level crossing (Westergate Street, Westergate). The averaged measured nitrogen dioxide concentration at this location was  $19.0\mu\text{g}/\text{m}^3$ .

### **Automatic Monitoring Data**

Arun District Council has no automatic monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

**Diffusion Tube Monitoring Data**

Arun District Council measured nitrogen dioxide concentrations at fourteen locations across the district, including one duplicate monitoring site (The Causeway, Arundel).

All measurements are bias adjusted.

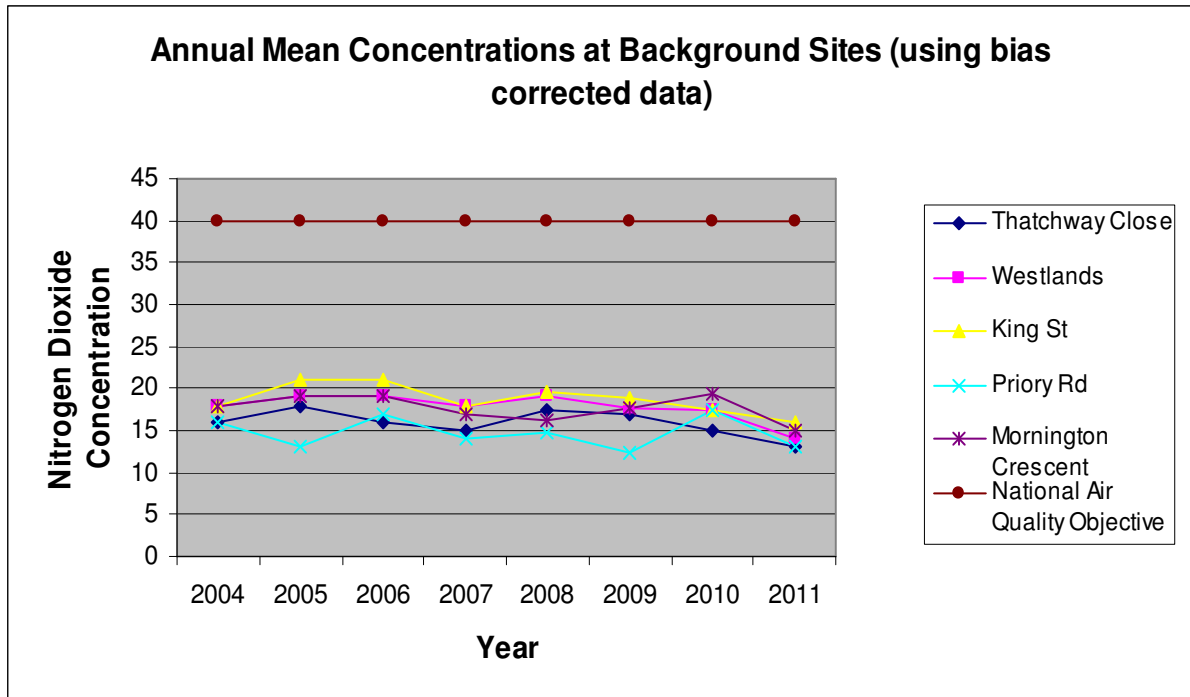
There are no AQMA's in the district.

**Table 2.3 Results of nitrogen dioxide diffusion tubes**

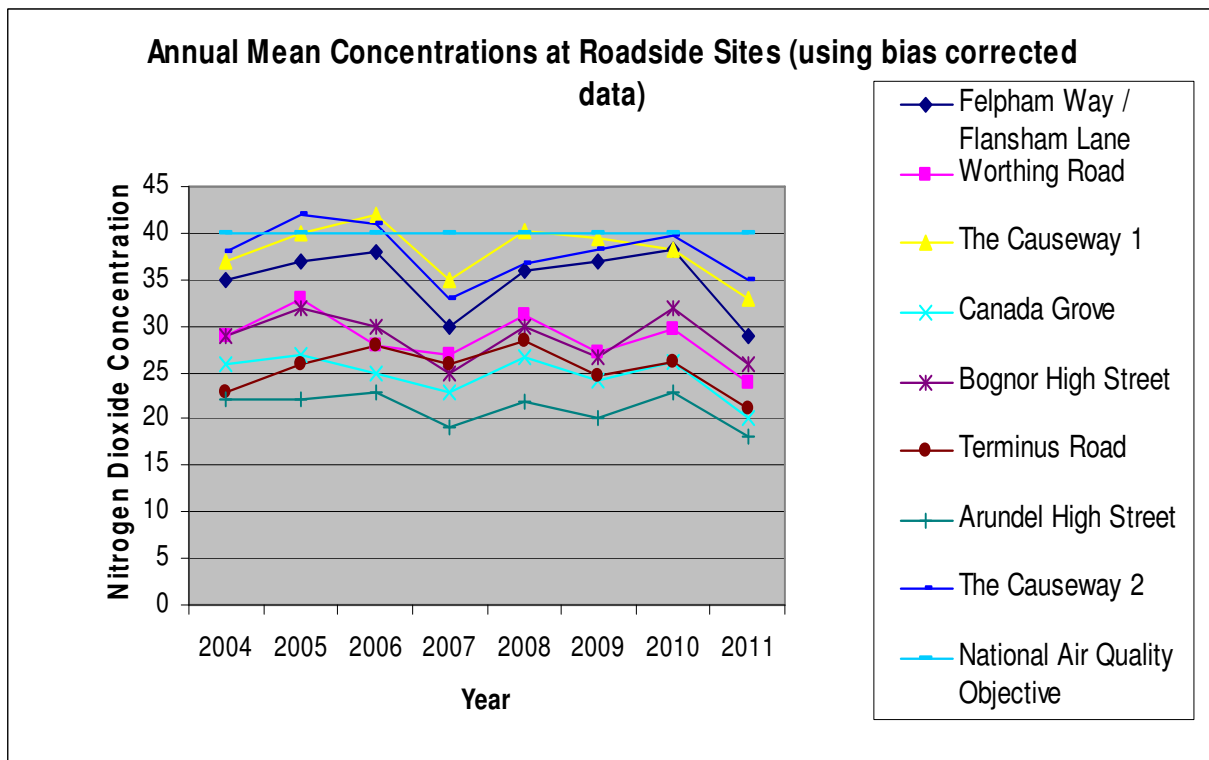
Site ID	Location	Within AQMA?	Data Capture 2011 %	Annual mean concentrations( $\mu\text{g}/\text{m}^3$ ) Bias adjusted			
				2008	2009	2010	2011
BR High Street	Bognor	No	100	30	27	32	26
Church Lane	Bognor	No	100	18	18	20	15
Mornington Crescent	Bognor	No	100	16	18	19	15
Canada Grove	Bognor	No	100	30	24	26	20
Terminus Road	Littlehampton	No	100	28	25	26	21
A259 Worthing Road	Littlehampton	No	100	31	37	30	24
Thatchway Close	Littlehampton	No	100	17	17	15	13
Westlands	Littlehampton	No	100	19	18	17	14
Arundel High Street	Arundel	No	100	22	20	23	18
A27 The Causeway	Arundel	No	92	40	40	38	33
King Street	Arundel	No	100	20	19	17	16
Priory Road	Arundel	No	100	15	12	18	13
A259 Felpham Way / Flansham Lane	Bognor	No	100	36	37	38	29
A27 The Causeway 2	Arundel	No	100	37	38	40	35
Westergate Level Crossing	Westergate	No	77	-	-	-	19
A27 The Causeway Hotel Facade	Arundel	No	50	-	-	-	19*

\* - Annualised – See Appendix D

**Figure 2.1: Trends in Annual Mean Nitrogen Dioxide Concentrations (2004-2011) measured at Background Diffusion Tube Monitoring Sites**



**Figure 2.2 Trends in Annual Mean Nitrogen Dioxide Concentrations (2004-2011) measured at Roadside Diffusion Tube Monitoring Sites**



**2.2.2 PM<sub>10</sub>**

Arun District Council has no particulate monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

**2.2.3 Sulphur Dioxide**

Arun District Council has no sulphur dioxide monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

**2.2.4 Benzene**

Arun District Council has no benzene monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

**2.2.5 Other pollutants monitored**

Arun District Council has no other monitoring sites or monitors within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

**2.2.6 Summary of Compliance with AQS Objectives**

Arun District Council has examined the results from monitoring in the district. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

### **3 Road Traffic Sources**

#### **3.1 Narrow Congested Streets with Residential Properties Close to the Kerb**

Arun District Council reviewed narrow congested streets in previous rounds of the review and assessment of air quality and considered new developments completed since the 2009 Update and Screening Assessment.

**No streets were identified which fulfil the criteria previously and presently used to be categorised as a “congested street”.**

**No new streets have been identified as congested, nor have there been significant changes in congestion (traffic volumes).**

**No new locations of increased public exposure due to the building of residential properties adjacent to these types of roads have occurred.**

Arun 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**

Arun District Council reviewed locations where people may spend 1-hour or more close to traffic in previous rounds of the review and assessment of air quality and considered new developments completed since the 2009 Update and Screening Assessment

**No locations were found to have individuals who may be exposed within 5 m of the kerb for 1-hour or more.**

**No new locations of exposure have been identified.**

Arun District 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.**

Arun District Council reviewed locations with high flows of buses and or heavy goods vehicles in previous rounds of the review and assessment of air quality.

**No locations were identified which fulfil the criteria.**

**No roads in the area have a high proportion (>20%) of buses and/or heavy goods vehicles.**

Arun District Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

### **3.4 Junctions**

Two new junctions have been identified on roads with traffic flows of more than 10,000 vehicles per day. These are the junctions connecting the North Bognor Regis Relief Road, and Policy Site 6 which are under construction, with the A259 Chichester Road at North Bersted, and with the A259 Flansham Lane at Flansham. There are no areas of relevant exposure within 10m of the kerb in the vicinity of either of these junctions.

A further junction between the North Bognor Regis Relief Road and the A29 Shripney Road is under construction. There are no areas of relevant exposure within 10m of the kerb in the vicinity of this junction.



**No new “busy” junctions require Detailed Assessment.**

Arun District Council has assessed new/newly identified junctions meeting the criteria in Section A.4 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

### **3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment**

The new Littlehampton Academy Access / Fitzalan Link road is currently under construction. An air quality assessment for this proposed relief road carried out at the planning stage satisfied the requirements of technical guidance LAQM.TG(09). Residual effects of the changes in traffic emissions associated with the operational phase have been assessed as being “large” to “imperceptible” in magnitude and “slight adverse” to “moderate beneficial” in significance. The development is not predicted to result in any exceedance of any UK Air Quality Objectives.

Construction of a major mixed development north of Bognor Regis (“Policy Site 6”) is ongoing and construction of the new North Bognor Regis Relief Road has now commenced. An air quality assessment for this proposed relief road carried out at the planning stage satisfied the requirements of technical guidance LAQM.TG(09). The results of the assessment indicate that the Assessed Development will have a “negligible” to “minor” negative impact on air quality and predict that there will be no exceedance of UK Air Quality Objectives.

Outline planning permission has recently been obtained for a mixed use development comprising up to 600 dwellings, 4000m<sup>2</sup> employment floor space, and 235m<sup>2</sup> of local facilities at Courtwick, North Littlehampton. An air quality assessment satisfying the requirements of technical guidance LAQM.TG(09) shows that this development is likely to result in “negligible” to “small adverse” changes in air quality but that there will be no exceedance of UK Air Quality Objectives.

A further outline planning application is awaiting decision, the proposal comprising 1,260 dwellings, 13000m<sup>2</sup> employment floor space on land at Toddington (North Littlehampton Strategic Development Area). The assessment of the operational phase of the development identifies that nitrogen dioxide levels at all existing and proposed residential locations will be below the National Air Quality Objectives and none of the non residential locations are predicted to exceed DEFRA air quality Guidance.

**No new or proposed roads require detailed assessment.**

Arun District Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

### **3.6 Roads with Significantly Changed Traffic Flows**

Department for Transport traffic counts for West Sussex roads demonstrate that traffic flows for all motor vehicles on major roads have decreased steadily since 2006. Roads within Arun District with more than 10,000 vehicles per day were identified. The majority of these roads showed a decrease in traffic flows since the 2009 Update and Screening Assessment, a minority showed a small increase in traffic flow. Contrary to this trend one section of the A29, at Fontwell, showed an increase in traffic flow from 7775 in 2008 to 10145 in 2011 (+30.4%), this section of road has not previously been identified as being at risk of exceeding objectives. No further assessment is considered necessary at this time.

Refer to Appendix E for table of AADT traffic count data.

**No significant changes in traffic flows were identified which fulfil the criteria.**

Arun District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

### **3.7 Bus and Coach Stations**

**Arun District Council contains no major bus or coach stations and there have been none built since the last review and assessment.**

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

## 4 Other Transport Sources

### 4.1 Airports

The closest airports to Arun District Council are Gatwick and Shoreham. These airports are not situated within the local authority area nor do they border the district.

Arun District Council confirms that there are no airports in the Local Authority area.

### 4.2 Railways (Diesel and Steam Trains)

Arun District Council contains no locations where there are steam or diesel locomotives in operation.

- Arun District Council contains no major rail lines identified in Table 5.1 (LAQM TG (09)).
- There are no locations within the Arun District Council area with a background concentration of nitrogen dioxide higher than  $25 \mu\text{g}/\text{m}^3$ . The maximum background nitrogen dioxide concentration in 2011 was  $16.0 \mu\text{g}/\text{m}^3$

#### 4.2.1 Stationary Trains

Arun 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

Arun 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)

Arun District Council borders onto the English channel with one harbour at Littlehampton, however this port does not have significant numbers of ship

## **Arun District Council**

movements. Littlehampton's harbour traffic is predominantly pleasure craft with some aggregate loader ships (approx. 50 per year).

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

## 5 Industrial Sources

### 5.1 Industrial Installations

Industrial sources of emissions controlled under the Environmental Permitting (England & Wales) Regulations 2010 are set out in Appendix C.

#### 5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

There have been no new or proposed industrial installations for which an Air Quality Assessment was required since the last Updating and Screening Assessment in 2009. **No further action is required.**

**No new or proposed installations have been made in the adjacent councils, Chichester, Horsham and Worthing, which would impact on Arun district.**

Arun 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

The following significant installations have ceased operating since the last Update & Screening Assessment in 2008.

- Tarmac Topblock Limited, Ford – Production of Concrete Products
- Eurotek Office Furniture Ltd., Bognor Regis – Waste Wood Combustion

There are no significant changes in emissions from other existing process nor have there been additional new sources of emissions within or neighbouring the district.

**No further action is required.**

Arun 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**

Environmental Permits have been granted in respect of the following installations:

- Anaerobic Digestion Facility, including a 1MWhr CHP module utilising biogas as fuel, at Barfoot Energy Ltd., Sefter Farm, Pagham.
- Small Waste Oil Burner (<0.4MW), Hutchings Vehicle Services, 17 Durban Road, Bognor Regis.
- Small Waste Oil Burner (<0.4MW), M J Vehicle Services, Brookside Avenue, Rustington.
- Dry Cleaning installation, Corniche Laundry Services Ltd, Ford Industrial Estate, Yapton.
- Sludge Drying Plant, Southern Water Services Ltd., Ford Wastewater Treatment Works.

None of the above new installations are determined to be likely to give rise to significant pollutant emissions.

**No further action is required.**

Arun District Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

## **5.2 Major Fuel (Petrol) Storage Depots**

**There are no major fuel (petrol) Storage depots in the district.**

There are no major fuel (petrol) storage depots within the Local Authority area.

### 5.3 Petrol Stations

Arun District Council has currently has 11 petrol stations with Environmental Permits (6 are permitted for “Stage II” Petrol Vapour Recovery) operating within its area, (*refer to Appendix E for Industrial Sources list*).

One petrol station is located near to a road which exceeds 30,000 (AADT) vehicles per annum (Shell Fontwell petrol station, adjacent to the A27). (*Refer to Appendix D for AADT of major roads.*) Shell Fontwell was considered in the previous round of Update and Screening Assessments 2009 and does not meet the specified criteria for a further assessment.

**No further action required.**

Arun District Council confirms that there are no petrol stations meeting the specified criteria.

### 5.4 Poultry Farms

**Arun District Council contains no significant poultry farms within its area.**

Arun District Council confirms that there are no poultry farms meeting the specified criteria.



## 6 Commercial and Domestic Sources

### 6.1 Biomass Combustion – Individual Installations

Planning permission has been granted for part demolition and redevelopment of Littlehampton Academy including a new access road and biomass boiler (WSCC/083/10/LU). A Local Air Quality Assessment accompanied the application and concluded that “impacts from the biomass boiler and traffic on local NO<sub>2</sub> and PM<sub>10</sub> concentrations at locations of relevant exposure are negligible according to IAQM criteria and a low priority according to Environmental Protection UK Criteria.” Project completion is anticipated during 2012, biomass boiler details are subject to change. Applications for approval under the Clean Air Act 1993 have not been received, if installed the biomass boiler will be further considered in the next round of review and assessment.

**No further assessment is required.**

Arun District Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

### 6.2 Biomass Combustion – Combined Impacts

The combined impact of biomass combustion was assessed in a semi commercial area of Littlehampton in the Updating and Screening Assessment 2009. The emission density from the combined biomass installation was significantly below the threshold for the assessed area. There are no new or other existing areas with higher densities of houses and service sector biomass combustion appliances within the district.

**There is no requirement to undertake a further detailed assessment.**

Arun District Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

### **6.3 Domestic Solid-Fuel Burning**

There are no new or existing areas within the district identified as having significant coal burning, defined as any area of about 500x500 with more than 50 houses burning coal/smokeless fuel as their primary source of heating.

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

## 7 Fugitive or Uncontrolled Sources

No locations of significance have been identified in previous review and assessments. No new sources or relevant exposures have been introduced since the last review and assessment.

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

## 8 Conclusions and Proposed Actions

### 8.1 Conclusions from New Monitoring Data

**New monitoring data for 2011 has shown that there are no areas likely to exceed the air quality objectives in Arun district.**

Monitoring with NO<sub>2</sub> diffusion tubes at background sites (Figure 2.1) has shown to be slightly higher than mapped background concentrations

(<http://laqm.defra.gov.uk/maps/maps2010.html#2010BackgroundMaps>). Most

locations have stayed between 15 - 20 µg/m<sup>3</sup> over the last 5 years monitoring.

Monitoring with NO<sub>2</sub> diffusion tubes at roadside sites (Figure 2.2), since 2003 initially showed a slight decline and subsequently levelled off to range between 20 - 40 µg/m<sup>3</sup>. No (diffusion tube) measured location in the district, exceeded the annual mean concentration limit of 40 µg/m<sup>3</sup> in 2010. Trends show that at all roadside sites annual concentrations have decreased in 2011; roadside concentrations are also the lowest since nitrogen dioxide diffusion tube monitoring commenced in 2004.

The location with the highest measured concentration, the Causeway near Arundel, has marginally exceeded the air quality objective in previous years. From 2004 a duplicate diffusion tube has been co-located to provide a more robust measurement. The averaged measured concentration was below the objective and when re-calculated back to the closest location of relevant public exposure, the result of this calculation was significantly below the objective. The averaged annual measured concentration for both diffusion tubes at the Causeway has fallen from 39.0µg/m<sup>3</sup> in 2010 to 34.0ug/ m<sup>3</sup> in 2011.

A further diffusion tube was deployed at the nearest sensitive receptor location for the latter half of 2011. The annualised average measured concentration at the premises façade for this period was 19.2ug/ m<sup>3</sup> (see Appendix D).

**No further Detailed Assessment required.**

## 8.2 Conclusions from Assessment of Sources

**The review and assessment of air quality for Arun District Council in 2011, has identified no new likely sources of emissions to air which are likely to lead to further detailed assessments.**

The major roads in the district showed no significant changes in traffic flows. There has been a steady decline in flows across West Sussex County Council managed roads as well as the Highways Agency managed network roads since 2006. In addition no new roads have been built or altered since the last review and assessment?

There were no other transport sources which required further assessment. These include airports, railways, ports and shipping.

There were no industrial sources which required further assessments. Some new industrial installations were given planning permission since the last review and assessment. These new installations require no further detailed assessment.

There were no new petrol stations identified as being within the criteria distance of a major road with over 30,000 vehicles (AADT). No further detailed assessment was required.

There were no new biomass installations operating since USA 2009. An assessment of the combined biomass appliances was carried out for USA 2009 this determined that there would be no likely exceedences of air quality objectives. No new areas in the district meet the criteria. No further detailed assessment is required.

**No further Detailed Assessment required.**

### **8.3 Proposed Actions**

The Updating and Screening Assessment for 2012 has identified no likely measured exceedences of the air quality objectives.

Arun District Council will continue to monitor at locations which are determined to be relevant locations of exposure to air pollutants. The council will also utilise data from neighbouring authorities within the Sussex Air Quality Partnership Network and have access to the Sussex County Air Quality Laboratory for monitoring any new locations which may be determined a risk in the future.

**Arun District Council will be submitting a Progress Report in 2013.**

## 9 References

- DEFRA (2009) Local Air Quality Management Technical Guidance,  
(LAQM .TG (09))
- DEFRA (2009) Local Air Quality Management Policy Guidance, (LAQM  
.PG (09))
- The Environment Act (1995)
- The Environmental Protection Act (1990)
- The Air Quality (England) Regulations 2000
- The Air Quality (England)(Amendment) Regulations 2002

# Appendices

Appendix A: QA/QC Data

Appendix B: Location Maps

Appendix C: Industrial Sources

Appendix D: Estimation of annual mean concentration from short-term monitoring data

Appendix E: Roads with Significantly Changed Traffic Flows



## **Appendix A: QA:QC Data**

### **Diffusion Tube Bias Adjustment Factors**

Arun District Council utilises the national bias adjustment figures for the laboratory it contracts to supply and analyse the results.

Data from the NO<sub>2</sub> diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location data-base as as collated by DEFRA Local Air Quality Management Helpdesk..

[http://laqm.defra.gov.uk/documents/Diffusion\\_Tube\\_Bias\\_Factors\\_v03\\_11.xls](http://laqm.defra.gov.uk/documents/Diffusion_Tube_Bias_Factors_v03_11.xls)

The NO<sub>2</sub> tube preparation method used is 50% triethanolamine (TEA) in acetone.

The supplier is the South Yorkshire Air Quality Samplers

The bias adjustment factor for the South Yorkshire Laboratory in 2011 was 0.79.

### **Factor from Local Co-location Studies (if available)**

Arun District Council undertakes no co-location studies

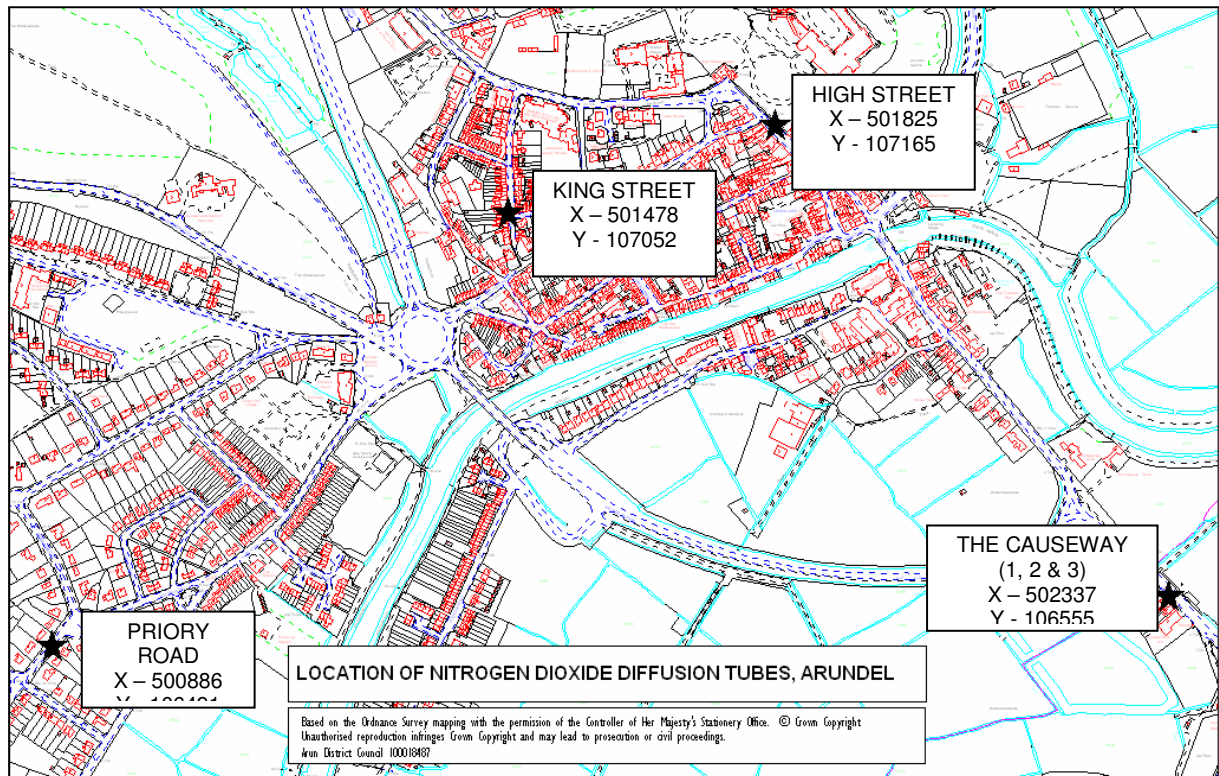
### **QA/QC of diffusion tube monitoring**

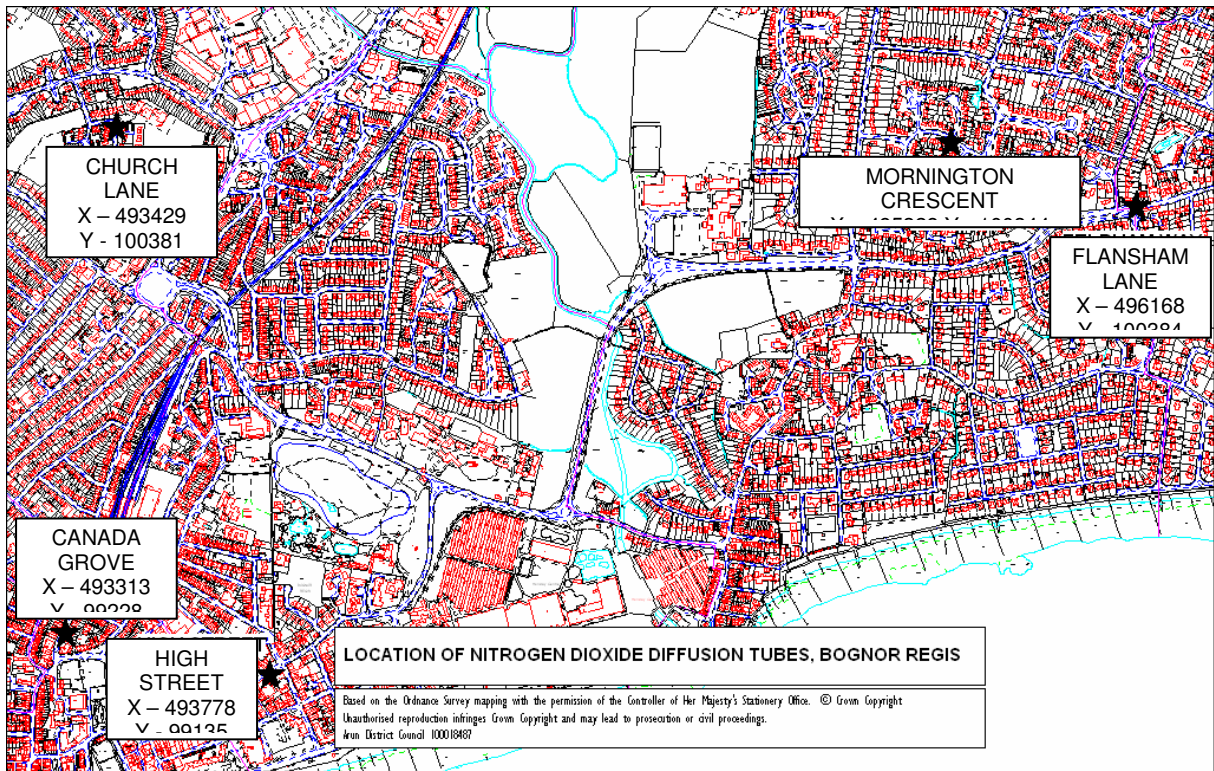
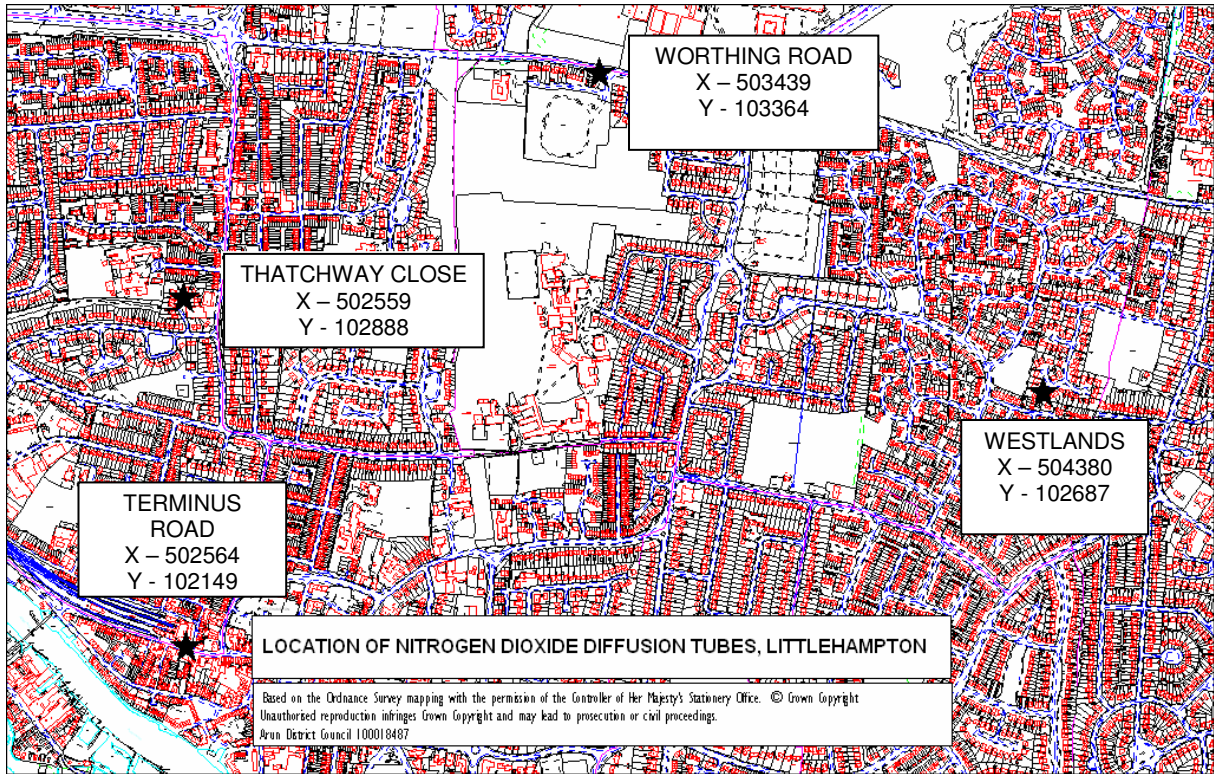
South Yorkshire Air Quality Samplers participate in the Workplace Analysis Scheme for Proficiency (WASP) and for the period April 2010 – December 2011 100% of results submitted were subsequently determined to be “satisfactory”.

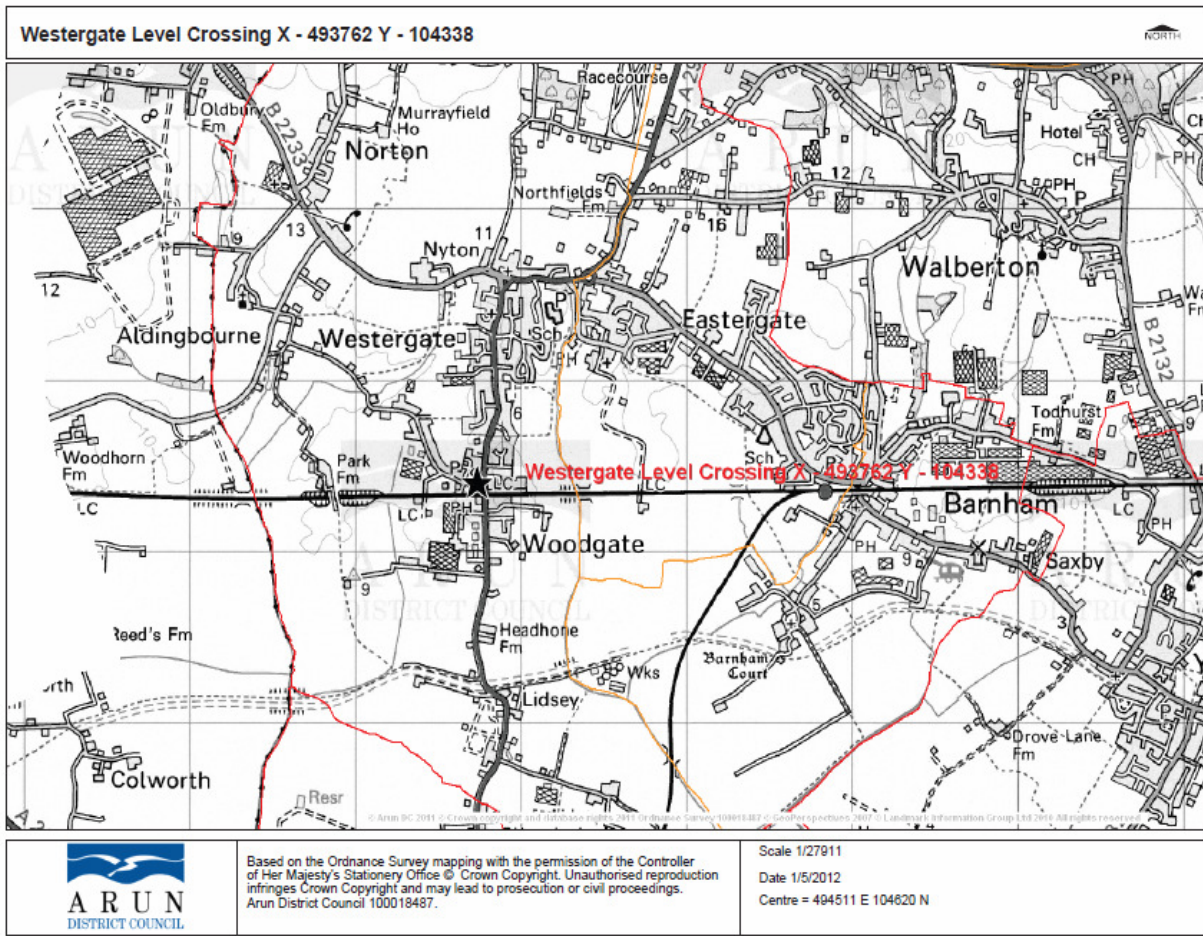
# Appendix B: Location Maps

## Distribution of Nitrogen Dioxide Diffusion Tubes

The location of nitrogen dioxide (NO<sub>2</sub>) diffusion tubes in Arun district are shown on following pages:







## Appendix C: Industrial Sources

**Table C1: Process installations in Arun District Council**

<b>PROCESS/INSTALATION</b>	<b>ADDRESS OF INSTALLATION/PROCESS</b>
<b>Part A1</b>	
Disposal of Waste by Landfill	Lidsey Landfill Ltd., Bognor Regis, West Sussex, PO22 9PL
Extraction, Handling and Processing of Crude Oil	Midmar Energy, Lidsey Well Site, Lidsey Road, Nr Bognor Regis, West Sussex, PO22 9PH
Sludge Drying Plant	Southern Water Services Ltd., Ford Waste Water Treatment Works, Ford, Arundel, West Sussex, BN18 0HY
Anaerobic Digestion	Barfoot Energy Ltd., Sefter Farm, Pagham, West Sussex, PO21 3PX
Waste Sterilisation	Ethos Recycling Ltd., Littlehampton Waste Treatment Plant, Unit A, Fort Road, Wick, Littlehampton, West Sussex, BN17 7QU
<b>Part B</b>	
Roadstone Coating Plant	Tarmac Southern Ltd., Quayside, Littlehampton, West Sussex, BN17 5DD
Cremation of human remains	The Worthing Crematorium, Horsham Road, Findon, West Sussex
Breeding of Maggots	Marine Pack Ltd., T/A National Bait Company, Lidsey Farm, Lidsey, West Sussex
Aluminum Foundry Process	Finecast Foundry Ltd, Unit 1, Lineside Way, Lineside Industrial Estate, Littlehampton, West Sussex BN17
<b>Respraying of Road Vehicles</b>	
Respraying of Road Vehicles	Poling Motor Company, Fordingbridge Industrial Estate, Barnham Road, Barnham, West Sussex, PO22 0HD
<b>Small Waste Oil Burner</b>	
Small Waste Oil Burner	Chris Clarke Cars, Spencer Street, Bognor Regis, West Sussex, PO22 1AN
Small Waste Oil Burner	Yeomans Honda, Chichester Road, Elbridge, Chichester, West Sussex, PO21 5EH
Small Waste Oil Burner	Hutchings Vehicle Services, 17 Durban Road, Bognor Regis, West Sussex, PO22 9QT
Small Waste Oil Burner	M J Vehicle Services, Unit 13 Brookside Business Park, Rustington, West Sussex, BN16 3LP
<b>Petrol Stations</b>	
Unloading of Petrol into Storage <b>PVR I only</b>	Rose Green Service Station, Hewarts Lane, Bognor Regis, West Sussex, PO21 3DS
Unloading Petrol into Storage <b>PVR I only</b>	Pace Petrol Filling Station, 97, Felpham Way, Bognor Regis, West Sussex, PO22
Unloading Petrol into Storage <b>PVR I only</b>	Pace Petrol Filling Station, Nyton Road, Westergate, Chichester, West Sussex, PO20 8QB

## Arun District Council

Unloading Petrol into Storage <b>PVR I &amp; II</b>	Tesco Stores Limited, Broadpiece, Littlehampton, West Sussex, BN17 5RA
Unloading Petrol into Storage <b>PVR I &amp; II</b>	Tesco Stores Limited, Shripney Road, Bognor Regis, West Sussex, PO22 9ND
Unloading Petrol into Storage <b>PVR I &amp; II</b>	Shell Eastfield, Rustington Bypass, Rustington, Littlehampton, West Sussex, BN17 6LE
Unloading Petrol into Storage <b>PVR I &amp; II</b>	Shell Fontwell, Arundel Rd, Fontwell, BN18 OSB
Unloading Petrol into Storage <b>PVR I &amp; II</b>	Rustington Filling Station, 102, Worthing Road, Rustington, Littlehampton, West Sussex, BN16 3LS
Unloading Petrol into Storage <b>PVR I only</b>	Snax 24 Ltd, Lyminster Road, Lyminster, Littlehampton, West Sussex
Unloading Petrol into Storage <b>PVR I &amp; II</b>	Regis Service Station, 449 Chichester Road, Bognor Regis, West Sussex, PO21 5DS
Unloading Petrol into Storage <b>PVR I only</b>	Cuff Miller & Co (Littlehampton) Ltd, Horsham Road, Littlehampton, BN17 6BX
<b>Dry Cleaners</b>	
Dry Cleaners	Sandra's Village Laundry & Dry Cleaners, 146 Sea Road, East Preston, BN16 1NN
Dry Cleaners	Colshaz Limited, T/A James Dry Cleaners, 39a Queensway, Bognor Regis, PO21 1QN
Dry Cleaners	Johnson Cleaners UK Ltd, 166 The Street, Rustington, BN16 3DA
Dry Cleaners	Johnson Cleaners UK Ltd, 2 Central Buildings, London Road, Bognor Regis, PO21 1PW
Dry Cleaners	Kingfisher Cleaners, Shop 3 Station Parade, Station Road, East Preston BN16 3AE
Dry Cleaners	Beach Road Dry Cleaners, 4 Beach Road, Littlehampton, BN17 5HT
Dry Cleaners	Corniche Laundry Services Ltd., Unit 1C, Ford Industrial Estate, Yapton, Arundel, West Sussex, BN18 0HY

## Appendix D: Estimation of annual mean concentration from short-term monitoring data

A diffusion tube was placed at the premises façade Causeway, Arundel for a period of 6 months between July – December 2011. The measured mean concentration (M) for this period was  $16 \mu\text{g}/\text{m}^3$ . The process below was followed to estimate the annual mean concentration.

Two long-term, continuous monitoring sites, Eastbourne Devonshire Park and Brighton and Hove Preston Park, were chosen as comparison sites. These are background sites, which avoid local affects that may occur at roadside sites.

The annual (am) and period (pm) means for the both sites were worked out, giving an am/pm Ratio. An average ratio (Ra) was then determined. Multiplying the measured mean concentration for the site by the ratio gave the best estimate of the annual mean for the Causeway façade site in 2011.

Long term site	Annual Mean 2011 (Am)	Period Mean 2011 (Pm)	Ratio (Am/Pm)
Eastbourne Devonshire Park	7.9	6.6	1.2
Brighton and Hove Preston Park	8.4	6.9	1.2
Average (Ra)			1.2

Measured mean concentration x Average Ratio =  $M \times Ra = 16 \times 1.2 = 19.2 \mu\text{g}/\text{m}^3$ .

## Appendix E: Roads with Significantly Changed Traffic Flows

Major road AADT traffic count data in Arun District Council

Road	StartJunction	EndJunction	2008 AADT	2010 AADT	Difference
A259	A27(T)	Brazwick Avenue, Bognor	21590	21803	213
A259	Brazwick Avenue	A29 roundabout	13892	14231	339
A259	A29	B2132	22290	21783	-507
A259	B2132 Middleton Rd	Flansham Park	17841	16377	-1464
A259	Flansham Park, Bognor	B2132 Yapton Rd (south)	16831	15451	-1380
A259	B2132	B 2233	17631	16880	-751
A259	B2233	New Courtwick Lane, Littlehampton	22908	21027	-1881
A259	New Courtwick Lane	A284	25427	23337	-2090
A259	A284	B2187 Horsham Rd roundabout	20177	19745	-432
A259	B2187 Horsham Rd roundabout	B2187 Mill Lane roundabout	25427	22828	-2599
A259	B2187 Mill Lane roundabout	A280	27018	24202	-2816
A259	A280	B2140	32827	29372	-3455
A259	B2140	A2032	32571	31763	-808
A259	A2032	A24	25147	24460	-687
A27	A285	A29	43104	44075	971
A27	A29 west	A29 East	43659	43266	-393
A27	A29	A284 roundabout	28161	27473	-688
A27	A284 Arundel By-pass	A284 Lyminster Rd	34880	29956	-4924
A27	A284	A280	29365	28675	-690
A27	A280	Hollyacres, Worthing	25104	24550	-554
A27	Hollyacres	A24	27900	27336	-564
A29	A259	Rowan Way	21793	21272	-521
A29	Rowan Way, Bognor	Unclassified Road	11328	11100	-228
A29	Unclassified Road	A27	7775	10145	2370

### West Sussex: Index chart

2000 = 100

