



2011 Air Quality Progress Report for *Mid Sussex District Council*

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

Date (July 2011)



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Executive Summary

Monitoring data for January to December 2010 has been used to assess compliance with the national air quality objectives since the Updating & Screening Assessment undertaken in 2009.

The following conclusions have been reached for each of the pollutants:

Nitrogen dioxide:

The 2010 annual means were below the nitrogen dioxide (NO₂) objective at 13 monitoring sites.

The objective was exceeded at 6 locations.

Some of these were sites with relevant exposure i.e. residential premises within 15m of a monitoring site, or places where the public may be regularly exposed.

Consequently a Detailed Assessment has been undertaken and is currently with defra for appraisal.

It proposes that an Air quality Management Area (AQMA) be declared.

An Action Plan detailing how the detected NO₂ levels may be reduced will be produced within 18 months of the AQMA being declared.

Particulate matter (PM₁₀)

No further action required.

Sulphur dioxide

No further action required.

Benzene

No further action required.

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1 Introduction

1.1 Description of Local Authority Area

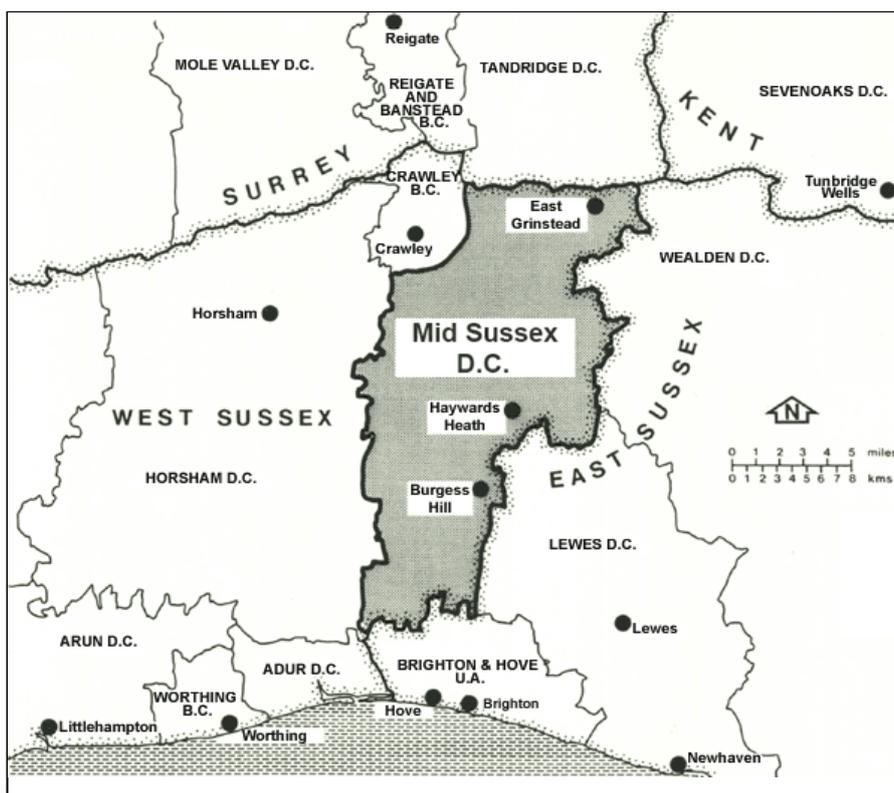
Mid Sussex District Council is located within the County of West Sussex. More than half the area is designated as an Area of Outstanding Natural Beauty and areas to the south of the district are part of the South Downs National Park (designated in 2009).

It lies on the eastern edge of the county and shares boundaries with East Sussex to the east, Surrey to the north and Brighton and Hove to the south.

Mid Sussex covers an area of some 33,400 hectares (approximately 128 square miles) and includes the three main towns of East Grinstead, Burgess Hill and Haywards Heath in a predominantly rural area in which there are some 25 villages and many small hamlets.

The District has a population of approximately 128,000.

Sixty percent of the population live in the three main towns. It is well served by transport links to London, Gatwick Airport, the coast and Europe.



1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1.

This table shows the objectives in units of microgrammes per cubic metre ($\mu\text{g}/\text{m}^3$).

For carbon monoxide the units used are milligrammes per cubic metre, (mg/m^3).

Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Maximum daily running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	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
Particles (PM₁₀) (gravimetric)	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
Sulphur dioxide	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

Under the Environment Act 1995, local authorities are required to Review and Assess air quality on a regular basis. A review of air quality means a consideration of the levels of pollutants for which objectives are prescribed in Regulations¹, and also estimations of 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 for Mid Sussex District Council was completed in June 2000 and concluded that the national air quality objectives were not likely to be exceeded at any locations in the District.

The second round of review and assessment was completed in April 2006 and concluded again that the national air quality objectives were not likely to be exceeded at any locations in the District.

The Air Quality Progress Report for 2008 identified the measured and predicted results over 12 months for the 11 sites being monitored across the district. 8 of the sites did not exceed the objectives. One site in East Grinstead was predicted to exceed the annual mean but this is not a relevant location (no residential properties within 15 metres of the site).

The measured levels at 2 relevant locations in the Stonepound crossroads area of Hassocks (Site ID's MSAQ10 & MSAQ11) indicated the annual mean air quality objective for nitrogen dioxide was likely to be exceeded. Additional monitoring of the area was undertaken, a further 8 monitoring sites being installed in June 2008.

The Updating & Screening Assessment 2009 confirmed that there were exceedences for the annual mean air quality objective for nitrogen dioxide at 2 sites in the Stonepound crossroads area of Hassocks (Site ID's MSAQ10 & MSAQ11) and there were potential exceedences of the annual mean air quality objective identified at 3 sites in the Stonepound crossroads area of Hassocks (Site ID's MSAQ12 MSAQ13 & MSAQ14).

One of these sites has relevant exposure (Site ID MSAQ13).

The Progress Report for 2010 reported on monitoring results for 2009 and the results at Stonepound indicated there were 6 sites which exceeded the annual mean air quality objective, 4 of which have relevant exposure.

A Detailed Assessment has since been undertaken for the Stonepound crossroads area of Hassocks.

It concluded an Air Quality Management Area (AQMA) should be declared – see Figure 1.1.

The report is currently with defra for appraisal.

A summary of previous reports are contained in Table 1.2

Figure 1.1 Map of Proposed AQMA Boundaries for Stonepond Crossroads Hassocks



Table 1.2 Summary of Previous Air Quality Review and Assessments

Previous Review /Assessment	Date	Exceedences	AQMA's Declared	Outcome
Stage 1 Review & Assessment Report	Dec 1998	None	None	
Stage 2 Review & Assessment Report	June 2000	None	None	
Updating & Screening Assessment 2003 *	April 2003	None	None	
Air Quality Progress Report 2004 *	April 2004	None	None	
Air Quality Progress Report 2005 *	April 2005	None	None	
Updating & Screening Assessment 2006 *	April 2006	None	None	
Air Quality Progress Report 2007 *	April 2007	None	None	
Air Quality Progress Report 2008 *	April 2008	NO ₂ at 2 sites	None	Detailed Assessment required for NO ₂
Updating & Screening Assessment 2009 *	May 2009	NO ₂ at 5 sites	None	Detailed Assessment required for NO ₂
Air Quality Progress Report 2010 *	May 2010	NO ₂ at 6 sites	AQMA to be declared	Detailed Assessment completed for NO ₂

* Copies of these reports are available on the Council's website at:-
<http://www.midsussex.gov.uk/page.cfm?pageID=2231>

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Mid Sussex District Council are members 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.

Refer to <http://www.sussex-air.net/>.

Mid Sussex have no automatic monitoring sites at present.

Table 2.1a Sussex air quality monitoring stations and pollutants monitored in 2010

Authority	Location	Pollutant
Adur	Shoreham High St	NO _x
Brighton & Hove C.C. Roadside	Pavilion Gate House	NO _x
Brighton & Hove C.C. Roadside	Hove Town Hall	NO _x
Brighton & Hove C.C. Background	Foredown Tower	O ₃
Brighton & Hove C.C. Mobile	Variable	NO _x , PM ₁₀
Chichester D.C.	A27 Ring Road	PM ₁₀ , NO _x
Chichester D.C.	Lodsworth	O ₃
Chichester D.C.	Orchard Street	NO _x
Crawley B.C.	East Gatwick	NO _x
Eastbourne B.C.	Willingdon Trees	PM ₁₀ , NO _x , PM _{2.5}
Eastbourne B.C.	Devonshire Park	PM ₁₀ , NO _x , O ₃
Hastings B.C. Roadside	Bulverhythe	PM ₁₀ , NO _x
Hastings B.C.	Freshfields	PM ₁₀ , NO _x
Horsham D.C.	Horsham centre	PM ₁₀ , NO _x

Authority	Location	Pollutant
Lewes D.C. Urban Roadside	Telscombe Cliffs	PM ₁₀ , NO _x , O ₃
Lewes D.C. Roadside	Town Centre	PM ₁₀ , NO _x
Rother D.C.	Rye Harbour	O ₃
Rother D.C.	Bexhill (A259)	NO _x , PM ₁₀
Horsham D.C. - AURN	Storrington	PM ₁₀ , NO _x
Worthing B.C.	High St, Worthing	NO _x
Wealden D.C.	Isfield	O ₃
Sussex County Lab.	Mobile unit	PM ₁₀ , NO _x , O ₃
DEFRA - AURN	Preston Park, Brighton	NO _x , PM ₁₀
DEFRA - AURN	Lullington Heath, Wealden	NO _x , O ₃ , SO ₂

Key:

- NO_x - oxides of nitrogen (includes NO₂ nitrogen dioxide)
- O₃ - ozone
- PM₁₀ - particles less than 10 microns
- SO₂ - sulphur dioxide

2.1.2 Non-Automatic Monitoring Sites

Across the District there are 20 locations where nitrogen dioxide diffusion tubes are located.

See Figure 2.2 and Table 2.2 for locations of the monitoring sites.

The Air Quality Progress Report 2008 indicated the Stonepound crossroads, Hassocks location as an area at risk of exceeding the annual mean air quality objective for nitrogen dioxide and consequently 8 additional monitoring sites were added to the network in July 2008.

In November 2010 an additional, background, monitoring site was added in Hassocks, bringing the total across the district to 20.

Results at Stonepound for 2010 indicate there are 6 sites which exceed the annual mean air quality objective, 4 of which have relevant exposure.

Figure 2.1
Map of all NO₂ monitoring areas in Mid Sussex

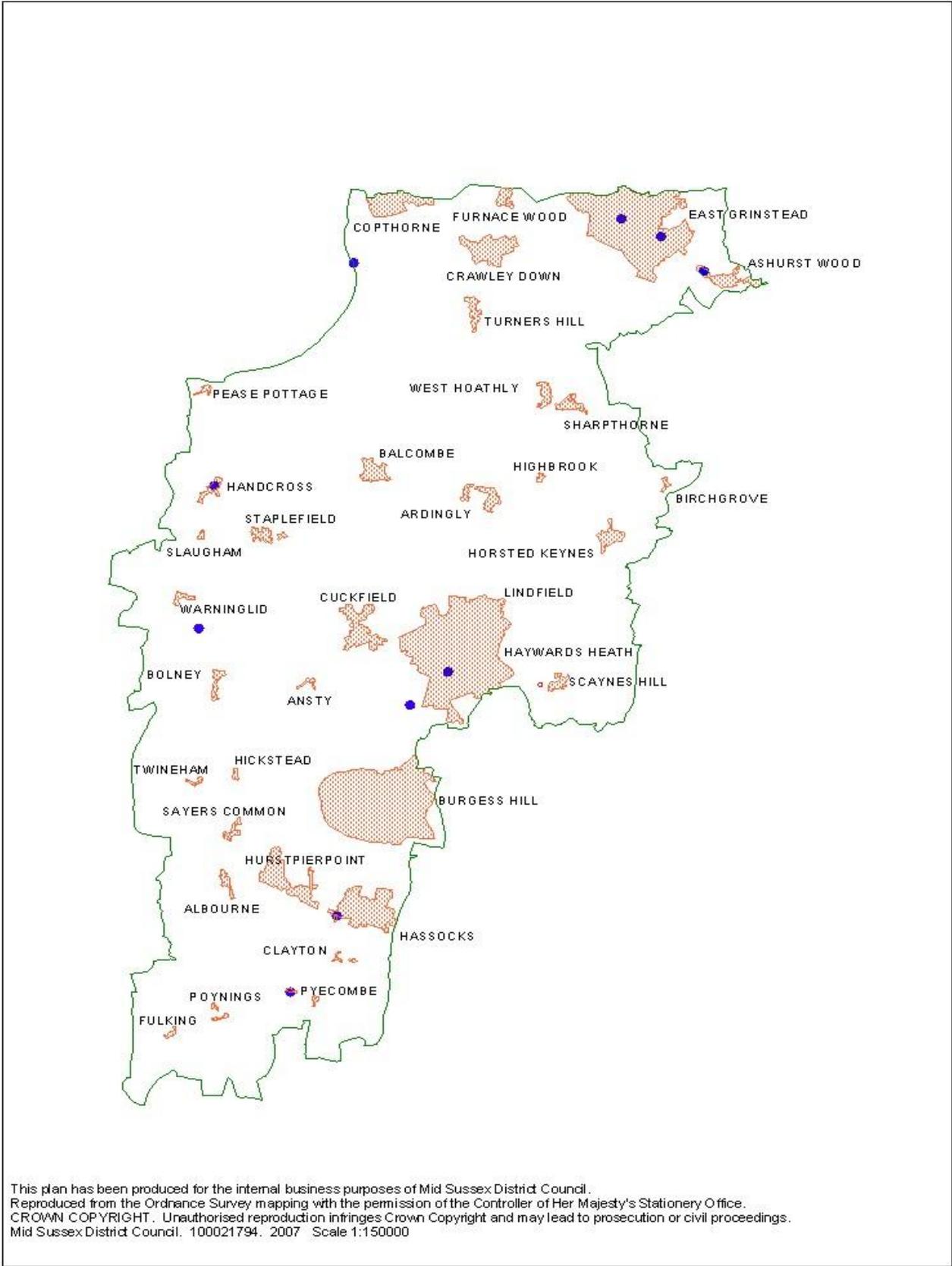


Table 2.1b Details of Non- Automatic Monitoring Sites

Site Name	Site Reference	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure?	Distance to kerb of nearest road (N/A if not applicable)
South Road Haywards Heath	MSAQ1	Roadside	X 533342 Y 123588	NO ₂	N	Y (0m)	2.5m
Partly constructed Haywards Heath Relief Road	MSAQ2	Roadside	X 532184 Y 122459	NO ₂	N	N	N/A
London Road East Grinstead	MSAQ3	Kerbside	X 538690 Y 138757	NO ₂	N	N	0.5m
Court Close East Grinstead	MSAQ4	Suburban	X 539919 Y 138162	NO ₂	N	Y (14m)	0.5m
Lewes Road East Grinstead	MSAQ5	Suburban	X 541243 Y 136998	NO ₂	N	N	1.5m
Smugglers End Handcross	MSAQ6	Roadside	X 526137 Y 129830	NO ₂	N	Y (0m)	N/A
Crabbet Park Worth	MSAQ7	Suburban	X 530440 Y 137280	NO ₂	N	Y (0m)	N/A
Pyecombe Street Pyecombe	MSAQ8	Roadside	X 528477 Y 112870	NO ₂	N	Y (7.5m)	1m
Water Tower Colwood Lane Warninglid	MSAQ9	Rural	X 525658 Y 125037	NO ₂	N	N	N/A
Stonepound 1 Keymer Road Hassocks	MSAQ10	Roadside	X 529911 Y 115489	NO ₂	AQMA Proposed	Y (6.7m)	1.5m
Stonepound 2 Keymer Road Hassocks	MSAQ11	Roadside	X 529915 Y 115489	NO ₂	AQMA Proposed	Y (0m)	5.5m

Bus Stop Keymer Road Hassocks	MSAQ12	Kerbside	X 530006 Y 115484	NO ₂	N	N	1.1m
Lamp Post Keymer Road Hassocks	MSAQ13	Kerbside	X 530044 Y 115472	NO ₂	N	Y (8.15m)	0.85m
Bus Stop London Road Hassocks	MSAQ14	Kerbside	X 529911 Y 115598	NO ₂	N	N	1.6m
Traffic Light Sign London Road Hassocks	MSAQ15	Kerbside	X 529930 Y 115600	NO ₂	N	Y (6.5m)	1.6m
Façade of residential premises Brighton Road Hassocks	MSAQ16	Roadside	X 529918 Y 115443	NO ₂	N	Y (0m)	11.5m
Lamp Post Brighton Road Hassocks	MSAQ17	Kerbside	X 529894 Y 115340	NO ₂	N	Y (10m)	1.25m
Bus Stop Brighton Road Hassocks	MSAQ18	Kerbside	X 529909 Y 115442	NO ₂	N	Y (9m)	1.98m
Lamp Post Hurst Road Hassocks	MSAQ19	Roadside	X 529779 Y 115557	NO ₂	N	Y (13m)	1.3m
New Way Lane Hassocks	MSAQ20	Rural	X 529100 Y 114273	NO ₂	N	N	N/A

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Nitrogen dioxide is a respiratory irritant associated with both acute (short-term) and chronic (long-term) effects on human health, particularly in people with asthma. Nitrogen dioxide (NO₂) and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NO_x). All combustion processes produce NO_x emissions, largely in the form of nitric oxide which is then converted to nitrogen dioxide mainly as a result of reaction with ozone in the atmosphere.

The principal source of nitrogen oxides emissions in the UK is road transport. Major roads carrying large volumes of high-speed traffic are a predominant source, as are conurbations and city centres with congested traffic. Other significant sources of nitrogen oxides emissions include the electricity supply industry. Industrial sources only make a small contribution to annual mean nitrogen dioxide levels.

Automatic Monitoring Data

Mid Sussex have no automatic monitoring sites.

Non - Automatic Monitoring Data

Mid Sussex District Council currently operate 20 diffusion tube sampling sites.

The results of sampling for 2010 are contained in Table 2.2a.
All data has been ratified (Appendix 1).

The 2010 annual means were below the NO₂ objective at most monitoring sites. However, the objective was exceeded at the following locations:

- London Road East Grinstead
Site reference: MSAQ3
No action required as no relevant exposure.
- Stonepound 1 Keymer Road, Hassocks
Site reference: MSAQ10 *
A Detailed Assessment has been undertaken and an Air Quality Management Area (AQMA) proposed.
- Stonepound 2 Keymer Road, Hassocks
Site reference: MSAQ11 *
A Detailed Assessment has been undertaken and an AQMA proposed.
- Bus Stop, Keymer Road, Hassocks
Site reference: MSAQ12
No action required as no relevant exposure.

- Lamp post, Keymer Road, Hassocks
Site reference: MSAQ13 *
Predicted levels at the nearest façade of a residential building indicate the objective will not be exceeded.
- Bus Stop, London Road, Hassocks
Site reference: MSAQ14
No action required as no relevant exposure.
- Traffic Light sign, London Road, Hassocks
Site reference: MSAQ15 *
Predicted levels at the nearest façade of a residential building indicate the objective will not be exceeded.

* These are sites with relevant exposure (residential premises within 15 m of the monitoring site, or places where the public may be regularly exposed).

**Table 2.2a Annual mean concentrations of Nitrogen Dioxide
January to December 2010
(measured using diffusion tubes)**

Site ID	Location	Within AQMA?	Data Capture 2010	Annual mean concentration 2010 ($\mu\text{g}/\text{m}^3$)	Annual mean concentration 2010 ($\mu\text{g}/\text{m}^3$) Adjusted for bias (0.85) ⁽¹⁾	Notes
MSAQ1	South Road Haywards Heath	No	100%	31.7	27.0	Relevant exposure
MSAQ2	Partly constructed Haywards Heath Relief Road	No	100%	19.3	16.4	Not relevant exposure
MSAQ3	London Road East Grinstead	No	100%	51.4	43.7	Not relevant exposure Estimated Concentration at nearest receptor 24.3$\mu\text{g}/\text{m}^3$ ⁽²⁾
MSAQ4	Court Close East Grinstead	No	91.7%	28.2	24.0	Relevant exposure
MSAQ5	Lewes Road East Grinstead	No	91.7%	46.8	39.8	Not relevant exposure Estimated Concentration at nearest receptor 23.7$\mu\text{g}/\text{m}^3$ ⁽²⁾
MSAQ6	Smugglers End Handcross	No	100%	39.0	33.2	Relevant exposure
MSAQ7	Crabbet Park Worth	No	100%	37.1	31.6	Relevant exposure
MSAQ8	Pyecombe Street Pyecombe	No	100%	38.5	32.8	Relevant exposure

MSAQ9	Water Tower Colwood Lane Warninglid	No	100%	15.4	13.0	Not relevant exposure Rural Background site
MSAQ10	Stonepound 1 Keymer Road Hassocks ⁽²⁾	AQMA Proposed	100%	64.9	55.2	Relevant exposure Trilocated tubes
MSAQ11	Stonepound 2 Keymer Road Hassocks ⁽²⁾	AQMA Proposed	100%	58.9	50.1	Relevant exposure Trilocated tubes
MSAQ12	Bus Stop Keymer Road Hassocks	No	83.0%	59.3	50.4	Not relevant exposure
MSAQ13	Lamp Post Keymer Road Hassocks	No	91.7%	53.4	45.4	Relevant exposure Estimated Concentration at nearest receptor 28.7µg/m³ ⁽²⁾
MSAQ14	Bus Stop London Road Hassocks	No	100%	48.6	41.3	Not relevant exposure
MSAQ15	Traffic Light Sign London Road Hassocks	No	100%	50.3	42.8	Relevant exposure Estimated Concentration at nearest receptor 31.1µg/m³ ⁽²⁾
MSAQ16	Façade of residenti premises Brighton Road Hassocks	No	100%	31.9	27.2	Relevant exposure.
MSAQ17	Lamp Post Brighton Road Hassocks	No	100%	33.0	28.0	Relevant exposure Estimated Concentration at nearest receptor 19.9µg/m³ ⁽²⁾
MSAQ18	Bus Stop Brighton Road Hassocks	No	100%	45.4	38.5	Relevant exposure Estimated Concentration at nearest receptor 27.3µg/m³ ⁽²⁾
MSAQ19	Lamp Post Hurst Road Hassocks	No	100%	28.2	23.9	Relevant exposure Estimated Concentration at nearest receptor 17.0µg/m³ ⁽²⁾

⁽¹⁾ Bias adjustment factor taken from the spreadsheet available at the defra website (v06.11)
<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

⁽²⁾ Concentration at nearest receptor calculated using the spreadsheet available at :-
<http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>
and the background map data available at :-
<http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

Table 2.2b Annual mean nitrogen dioxide concentrations (bias corrected) 2002 to 2010

Site ID	Location	Within AQMA	Annual mean concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias								
			2002 (1.16 bias)	2003 (0.87 bias)	2004 (0.95 bias)	2005 (0.95 bias)	2006 (0.90 bias)	2007 (0.77 bias)	2008 (0.87 bias)	2009 (0.84 bias)	2010 (0.85 bias)
MSAQ1	South Road Haywards Heath	No	28.8	28.4	26.0	25.4	26.2	24.7	28.1	26.7	27.0
MSAQ2	Partly constructed Haywards Heath Relief Road	No	N/A	N/A	N/A	N/A	14.5	14.5	14.7	15.0	16.2
MSAQ3	London Road East Grinstead	No	42.3	38.8	42.5	39.1	40.2	40.3	44.5	44.5	43.7
MSAQ4	Court Close East Grinstead	No	31.8	25.5	26.4	22.4	22.6	22.5	23.1	22.7	39.8
MSAQ5	Lewes Road East Grinstead	No	41.4	37.7	40.1	35.1	37.6	37.2	40.5	40.7	43.2
MSAQ6	Smugglers End Handcross	No	34.0	27.1	30.7	27.6	28.5	28.9	32.3	32.1	33.2
MSAQ7	Crabbet Park Worth	No	33.4	28.5	30.0	27.0	30.4	29.2	32.5	30.1	31.6
MSAQ8	Pyecombe Street Pyecombe	No	31.9	29.1	31.0	25.0	29.0	27.6	33.5	33.9	33.9
MSAQ9	Water Tower Colwood Lane Warninglid	No	12.1	12.6	12.5	11.8	11.4	11.2	11.3	11.7	13.0
MSAQ10	Stonepound 1 Keymer Road Hassocks	AQMA proposed	43.3	42.8	40.1	36.3	41.0	40.9	48.7	50.7	55.2
MSAQ11	Stonepound 2 Keymer Road Hassocks	AQMA proposed	N/A	N/A	N/A	39.4	44.7	44.1	48.1	50.4	50.1
MSAQ12	Bus Stop Keymer Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	46.4 ⁽¹⁾	45.5 ⁽²⁾	50.4
MSAQ13	Lamp Post Keymer Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	43.2 ⁽¹⁾	44.5	45.4
MSAQ14	Bus Stop London Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	42.4 ⁽¹⁾	43.8	41.3
MSAQ15	Traffic Light Sign London Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	39.3 ⁽¹⁾	41.3	42.8
MSAQ16	Facade of residential premises Brighton Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	26.5 ⁽¹⁾	24.5	27.2
MSAQ17	Lamp Post Brighton Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	25.0 ⁽¹⁾	25.6	28.0
MSAQ18	Bus Stop Brighton Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	32.1 ⁽¹⁾	35.3	38.5
MSAQ19	Lamp Post Hurst Road Hassocks	No	N/A	N/A	N/A	N/A	N/A	N/A	22.3 ⁽¹⁾	23.2	23.9

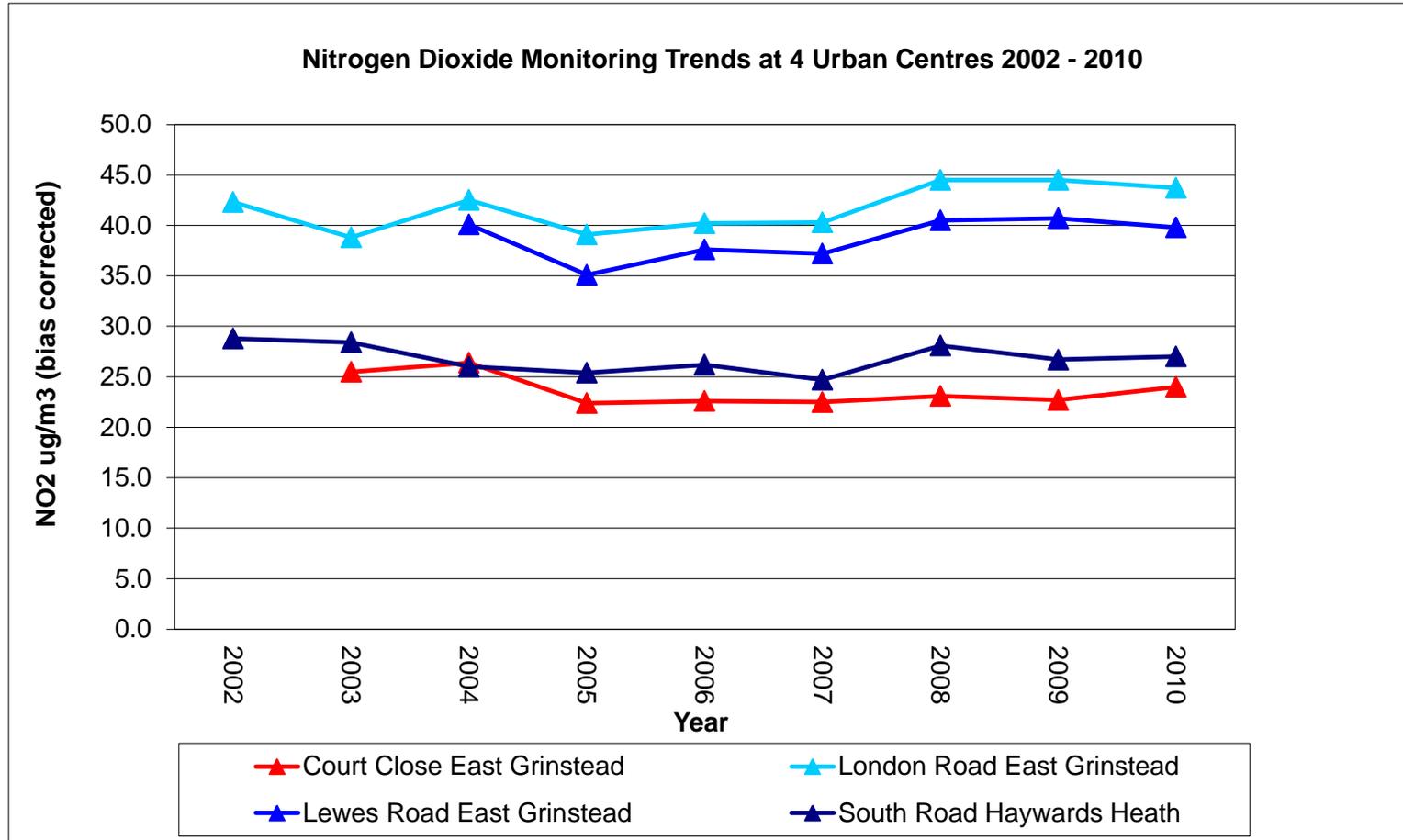
⁽¹⁾ Only six months data was available as the tubes were installed in July 2008.

The estimated annual mean was obtained using the method in Box 3.2 of the Local Air Quality Management Technical Guidance TG(09). See Appendix C.

⁽²⁾ Only nine months data was available due to theft.

The estimated annual mean was obtained using the method in Box 3.2 of the Local Air Quality Management Technical Guidance TG(09). See Appendix C.

Graph 2.2 a
Annual mean concentrations (bias corrected) 2002 to 2010 of nitrogen dioxide diffusion tube measurements at 4 urban centre sites

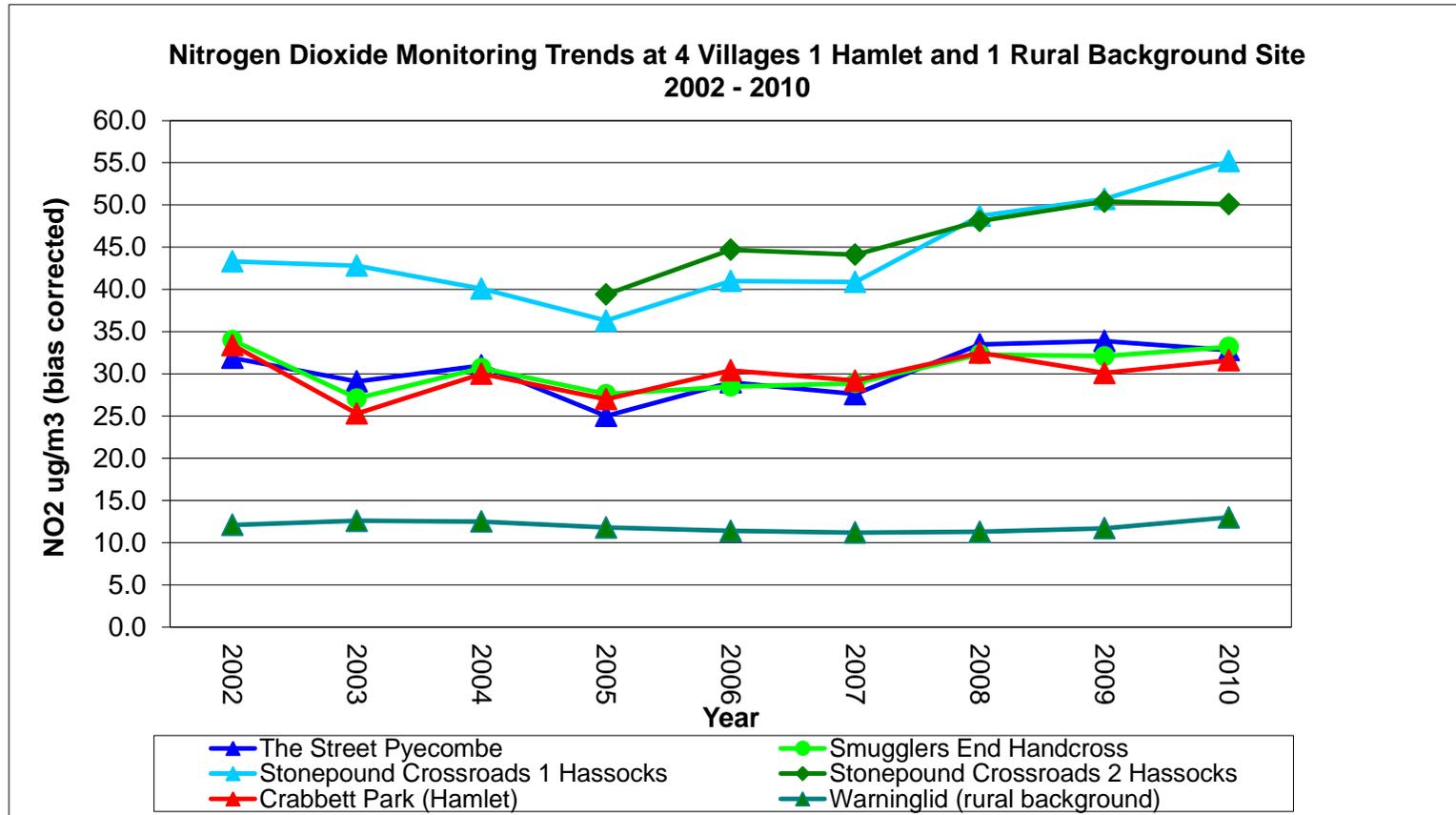


From 2005 to 2009 there has been a gradual increase in the monitored levels of nitrogen dioxide at 3 of the 4 urban centres. The 4th, Court Close East Grinstead, has remained at a relatively consistent level.

In 2010 the monitored levels declined slightly at 2 sites, London Road and Lewes Road East Grinstead.

Graph 2.2 b

Annual mean concentrations (bias corrected) 2002 to 2009 of nitrogen dioxide diffusion tube measurements at 4 Villages, 1 Hamlet and 1 Rural Background site



From 2005 to 2009 there has been a gradual increase in the monitored levels of nitrogen dioxide at 4 of the sites.

In 2010 the levels recorded at all the sites remained consistent, except those for Stonepound 1 Hassocks which increased by $4.5\mu\text{g}/\text{m}^3$.

The rural background has remained steady.

2.2.2 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. These emissions can be divided into three categories :-

1. Primary particles - emissions from combustion sources including road traffic, power generation, industrial processes etc
2. Secondary particles - formed by chemical reactions in the atmosphere and comprised principally of sulphates and nitrates
3. Coarse particles - emissions from a wide range of sources including re-suspended dusts from road traffic, construction works, mineral extraction etc.

Mid Sussex District Council does not have a monitoring site for PM₁₀, however, results from the Sussex-air Network's permanent automatic monitoring sites indicate the objective for PM₁₀ has not been exceeded across Sussex. Therefore, it is concluded unlikely that it will be exceeded in future years in Mid Sussex as no new industrial developments are currently planned in the District.

2.2.3 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. There are also significant emissions from other industrial processes.

As no new industrial sources or sources with substantially increased emissions have been identified and local knowledge indicates that there are no significant increase in domestic sources, it is concluded that the sulphur dioxide objective will not be exceeded in the Mid Sussex Area.

2.2.4 Benzene

Benzene is a known human carcinogen and also contributes to the formation of ground level ozone. The main source of benzene emissions in the UK are petrol vehicles, petrol refining, and the fuel distribution from those petrol stations without vapour recovery systems.

Results from benzene diffusion tube monitoring in Mid Sussex were considered in the Updating & Screening Assessment 2003 and the Progress Reports for 2004 and 2005 and indicated the benzene objective would not be exceeded then or in the future.

2.2.5 Summary of Compliance with Air Quality Standards Objectives

Mid Sussex District Council has examined the results from nitrogen dioxide monitoring in the district.

1 site in East Grinstead recorded an annual mean that exceeds the objective. However, it does not represent relevant exposure and so no further action is required.

6 monitoring sites in the Stonepound Crossroads area of Hassocks have recorded concentrations that exceed the annual mean objective.

4 of these represent relevant exposure

A Detailed Assessment has been undertaken for this area and is currently with defra for appraisal.

3 New Local Developments

Mid Sussex District Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Mid Sussex District Council confirms that all the following have been considered –

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

3.1 Road Traffic Sources

Mid Sussex confirms that there are no new/newly identified road traffic sources in the District since the 2009 Updating and Screening Assessment.

3.2 Other Transport Sources

Mid Sussex confirms that there are no airports, ports or locations with a large number of movements of diesel locomotives or sites where diesel/steam trains are regularly stationary for 15 minutes or more with relevant exposure within 15m, in the Local Authority area.

3.3 Industrial Sources

New or proposed installations

Mid Sussex confirms that there are no new or proposed industrial installations for which an air quality assessment has been undertaken or planning approval has been granted within its area or nearby in a neighbouring authority.

Existing installations with increased emissions or new relevant exposure

Mid Sussex 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.

New or significantly changed installations with no previous air quality assessment

Mid Sussex confirms that there are no new or significantly changed industrial installations with no previous air quality assessment for which planning approval has been granted within its area or nearby in a neighbouring authority.

Major fuel storage depots

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

Petrol Stations

Mid Sussex confirms there are no new petrol stations meeting the specified criteria.

Poultry Farms

Mid Sussex confirms that there are no new poultry farms meeting the specified criteria.

3.4 Commercial and Domestic Sources

Mid Sussex confirms that there are no biomass combustion plant or areas of significant domestic solid fuel burning in the Local Authority area.

3.5 New Developments with Fugitive or Uncontrolled Sources

Mid Sussex confirms that there are no new potential sources of fugitive particulate matter emissions in the Local Authority area.

4 Local / Regional Air Quality Strategy

Mid Sussex District Council currently does not have a local air quality strategy.

5 Air Quality Planning Policies

Mid Sussex District Council adopted validation criteria for planning applications in December 2010 which included as a local requirement the need for an Air Quality Assessment (AQA):-

“Where the development is proposed inside, or adjacent to an air quality management area (AQMA), or where the development could in itself result in the designation of an AQMA or where the grant of planning permission would conflict with, or render unworkable, elements of a local authority’s air quality action plan, applications should be supported by such information as is necessary to allow a full consideration of the impact of the proposal on the air quality of the area”

An AQA is also required for all developments of 150 dwellings or more or for commercial developments of 1500 sq m gross floor area or more.

Mid Sussex District Council is a member of the Sussex-air Partnership which is currently developing a Low Emissions Strategy. The strategy will produce policies and guidance on low emission planning, transport initiatives and air quality assessment, for use across Sussex.

6 Local Transport Plans and Strategies

West and East Sussex County Councils and Brighton and Hove City Council are the Highway Authorities for Sussex and produce separate Local Transport Plans (LTPs).

The West Sussex LTP has the following aims for air quality:

1. Provide information to district and borough councils for air quality monitoring and forecasting.
2. Work with district and borough councils when Air Quality Management Areas (AQMAs) are declared to develop Air Quality Action Plans (AQAPs).

7 Climate Change Strategies

Mid Sussex does not have a formal Climate Change Strategy.

It has adopted 'Our Commitment to the Environment' as its environmental policy, providing a framework for setting and reviewing environmental objectives and targets.

The main objectives and commitments are to:-

- Reduce our greenhouse gas emissions
- Reduce our energy and water requirements and improve energy efficiency
- Manage our waste, by minimising, storing, recycling and disposing of waste and packaging in a responsible manner
- Reduce the impact of our transport, by reducing the need to travel and then choosing alternative transport options where feasible
- Investigate the use of materials, products and components with a lower environmental impact
- Conserve and enhance the rich local landscape and biodiversity and encourage green connectivity to other green spaces within and on our borders
- Investigate green procurement options and encourage our suppliers to support our objectives

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Exceedences of the annual nitrogen dioxide objective have been identified at :-

- London Road, East Grinstead
No action required as no relevant exposure
- Stonepound 1, Keymer Road, Hassocks
Relevant exposure
Air Quality Management Area proposed
- Stonepound 2, Keymer Road, Hassocks
Relevant exposure
Air Quality Management Area proposed
- Bus Stop, Keymer Road, Hassocks
No action required as no relevant exposure
- Lamp post, Keymer Road, Hassocks
Relevant exposure
No action required as the Detailed Assessment predicted the level at the nearest façade is below objective
- Bus Stop, London Road, Hassocks
No action required as no relevant exposure
- Traffic light sign, London Road, Hassocks
Relevant exposure
No action required as the Detailed Assessment predicted the level at the nearest façade is below objective

8.2 Conclusions relating to New Local Developments

There are currently no planned new local developments that will require detailed consideration in the next Updating & Screening Assessment.

8.3 Proposed Actions

A Detailed Assessment has been completed for Stonepound Crossroads in Hassocks which proposes an Air Quality Management Area.

This is currently with defra for appraisal.

Investigation of additional and/or resiting of diffusion tube monitoring sites in the area will be undertaken once the proposed AQMA has been declared.

9 References

DEFRA (2002) The Air Quality (England) (Amendment) Regulations. HMSO.

DEFRA (2003) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum. HMSO.

DETR (2000) The Air Quality (England) Regulations. HMSO.

DETR (2000) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. HMSO.

DEFRA (2009) Local Air Quality Management Policy Guidance. LAQM.PG(09)

DEFRA (2009) Local Air Quality Management Technical Guidance. LAQM.TG(09)

DEFRA (2009) Local Air Quality Management Technical Guidance, FAQs relative to USA 2009 <http://www.uwe.ac.uk/aqm/review/index.html>

APEG (1999) Source apportionment of airborne particulate matter in the United Kingdom.
Report of the Airborne Particles Expert Group.

The Environment Act (1995)

The Environmental Protection Act (1990)

Appendices

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

The laboratory supplying our diffusion tubes is Bristol City Scientific Services. The tubes are prepared using 20% triethanolamine (TEA) in water. The bias adjustment factor of 0.85 was taken from the spreadsheet available at the defra website (v06.11)

<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias>

QA/QC Documentation from Bristol City Scientific Services

3rd June 2011

QA/QC Information for Nitrogen Dioxide Diffusion Tubes

The laboratory follows the procedures detailed in "Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance" published by AEA Energy & Environment in February 2008.

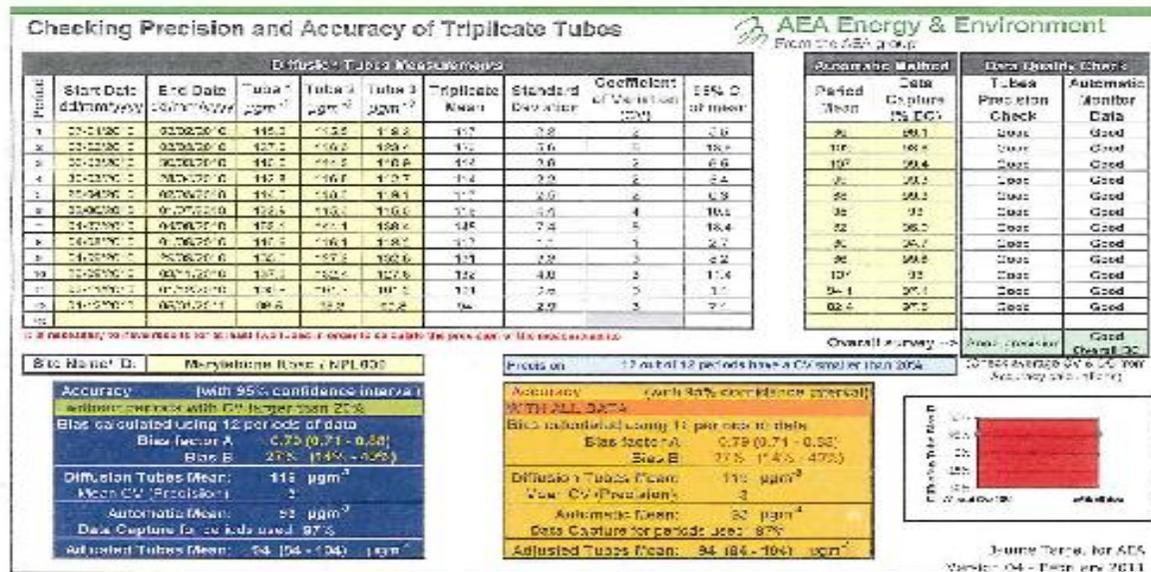
Tubes are prepared using 50µl of 20% triethanolamine (TEA) in water.

There are various parts to the QA/QC procedures:

- A full calibration is run each month and this is checked by running standards in each batch of tubes analysed. A typical batch size is 50 tubes – with this is run a high, medium and blank standard at the beginning of the run, a check medium standard and blank mid-run, and a high, medium and blank standard at the end of the run.
- The calibration is verified using a solution provided by AEA Energy & Environment as detailed in the "Practical Guidance".
- The laboratory participates in the WASP scheme (Workplace Analysis Scheme for Proficiency) in which we are provided with four spiked tubes every quarter. From the data it is possible to calculate a standardised result ($\mu\text{g NO}_2$ reported divided by actual spiked amount). Additionally it is possible to calculate a performance index where the aim is to reduce this to a minimum – currently a rolling performance minimum of less than or equal to 56.25 is classed as "good".
Data for rounds 106 - 112 attached.
- The WASP data from rounds 106 to 112 has been used to calculate uncertainty. The expanded uncertainty of the procedure using a coverage factor of 2 is 7.4%. It must be remembered that this is based on data for spiked tubes only so does not take into account uncertainty caused by tube preparation or exposure.
- The laboratory also participate in the field trial organised by WASP. Each month we send four tubes – three to be exposed and one blank. The data from these is compared to a reference concentration in order to obtain data including a bias factor.
The mean bias for the last year was 0.79

N G Rhodes

Team Leader (Environment)



WASP Results Lab 152 Round 97 onwards:

Round	97	98	99	100	101	102	103	104	105	106	107	108
Tube 1 ($\mu\text{g NO}_2$)	0.890	1.885	2.085	1.358	0.949	1.489	1.178	1.179	1.689	1.730	2.038	1.785
Tube 2 ($\mu\text{g NO}_2$)	1.573	1.228	2.093	1.474	2.576	1.431	0.916	1.108	1.008	1.662	2.154	1.442
Tube 3 ($\mu\text{g NO}_2$)	1.582	1.857	0.885	1.354	1.813	2.307	0.934	1.840	1.665	1.342	2.038	1.187
Tube 4 ($\mu\text{g NO}_2$)	0.914	1.217	0.879	1.467	0.914	1.960	1.071	1.960	0.992	1.394	2.227	1.821
Spike tube 1 ($\mu\text{g NO}_2$)	0.890	1.830	2.150	1.360	0.920	1.370	1.220	1.220	1.680	1.840	2.030	1.920
Spike tube 2 ($\mu\text{g NO}_2$)	1.580	1.190	2.150	1.470	1.860	1.370	0.940	1.220	0.960	1.840	2.200	1.470
Spike tube 3 ($\mu\text{g NO}_2$)	1.580	1.830	0.840	1.360	1.860	2.280	0.940	2.020	1.680	1.420	2.030	1.470
Spike tube 4 ($\mu\text{g NO}_2$)	0.890	1.190	0.840	1.470	0.920	2.280	1.220	2.020	0.960	1.420	2.200	1.920
Standardised result tube 1	1.000	1.019	0.970	0.999	1.032	1.087	0.966	0.966	1.005	0.940	1.004	0.919
Standardised result tube 2	0.996	1.032	0.973	1.003	1.385	1.045	0.974	0.908	1.048	0.903	0.979	0.981
Standardised result tube 3	1.001	1.015	1.054	0.998	0.975	1.012	0.994	0.911	0.991	0.945	1.004	0.807
Standardised result tube 4	1.027	1.023	1.046	0.998	0.993	0.860	0.878	0.970	1.033	0.982	1.012	0.948
Performance index	1.87	5.29	16.61	0.08	374.65	73.42	41.98	45.95	8.79	40.71	1.55	116.50
Rolling performance index (NOT best of 4 out of 5)				5.96	99.16	116.19	122.53	134.00	42.53	34.36	24.25	41.89
Rolling performance index (best 4 out of 5)				5.96	5.96	23.85	33.02	40.36	42.53	34.36	23.26	23.26
Performance classification (criteria from April 2009?) Good =<56.25 Acceptable =<225 Unacceptable >225				Good	Good	Good	Good	Good	Good	Good	Good	Good

Appendix B:**Nitrogen dioxide diffusion tube monitoring****Monthly results (bias corrected) January to December 2010**

Site ID	Location	Monthly Average levels of NO ₂ (µg/m ³)											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
MSAQ1	South Road Haywards Heath	41.1	33.7	31.9	27.4	28.6	30.2	27.6	25.3	29.2	33.3	39.9	32.4
MSAQ2	Partly constructed Haywards Heath Relief Road	28.1	22.8	15.4	18.0	14.4	15.5	13.0	13.0	14.0	17.6	33.1	26.1
MSAQ3	London Road East Grinstead	54.0	46.3	55.8	49.3	48.9	47.8	56.5	48.0	56.0	49.8	55.6	48.5
MSAQ4	Court Close East Grinstead	44.6	29.8	25.9	25.2	21.2	Lost	23.1	23.6	24.3	26.7	35.9	29.8
MSAQ5	Lewes Road East Grinstead	59.4	42.1	47.9	41.5	43.6	49.9	Lost	47.7	51.0	54.1	51.1	26.8
MSAQ6	Smugglers End Handcross	48.5	37.8	38.0	32.7	32.8	41.7	48.6	33.8	43.9	39.8	40.5	30.1
MSAQ7	Crabbet Park Worth	45.9	34.0	42.1	29.8	28.3	34.7	39.0	33.1	38.8	39.0	45.3	35.6
MSAQ8	Pyecombe Street Pyecombe	58.3	34.1	40.3	35.7	33.9	35.1	40.8	35.2	36.7	32.2	50.3	29.9
MSAQ9	Water Tower Colwood Lane Warninglid	19.7	17.2	13.6	14.0	11.7	12.9	10.2	9.3	11.3	14.7	29.2	20.4
MSAQ10	Stonepound 1 Keymer Road Hassocks	68.7	62.5	59.5	62.6	73.9	73.2	60.0	58.8	63.2	69.3	69.8	57.9
MSAQ11	Stonepound 2 Keymer Road Hassocks	64.1	53.8	61.7	55.3	64.8	68.2	58.1	54.5	55.8	60.9	62.6	46.8
MSAQ12	Bus Stop Keymer Road Hassocks	64.5	58.2	50.2	64.6	63.1	62.2	Lost	50.9	57.6	61.0	60.6	Lost
MSAQ13	Lamp Post Keymer Road Hassocks	Lost	57.1	49.5	50.5	65.8	57.4	46.9	52.7	57.3	61.6	30.3	58.7
MSAQ14	Bus Stop London Road Hassocks	47.2	45.7	59.4	43.1	45.0	53.2	54.8	39.5	50.8	50.1	53.9	40.3
MSAQ15	Traffic Light Sign London Road Hassocks	56.1	48.8	44.3	43.9	53.1	64.2	54.5	43.4	49.5	44.2	54.8	47.2
MSAQ16	Façade of residential premises Brighton Road Hassocks	38.3	35.5	26.1	31.5	30.6	26.2	27.1	27.2	25.7	32.2	44.6	38.3
MSAQ17	Lamp Post Brighton Road Hassocks	40.6	37.3	28.3	31.2	33.2	31.2	26.6	26.2	29.2	35.6	44.3	31.7
MSAQ18	Bus Stop Brighton Road Hassocks	43.2	48.4	38.0	44.0	47.1	49.0	44.7	39.6	41.6	46.7	55.3	46.6
MSAQ19	Lamp Post Hurst Road Hassocks	41.2	34.4	29.8	28.4	24.3	21.6	19.8	18.2	23.8	23.9	39.6	32.9

Appendix C:

Annualisation of monitoring results

NO₂ results at Bus Stop Keymer Road Hassocks 2009

The NO₂ annual mean from 3 long term continuous monitors was obtained for 2009 from the Air Quality Archive web site :- <http://www.airquality.co.uk>

The monitors lie within a 50 mile radius of the Stonepound, Hassocks area.

The annual mean (Am) was then divided by the period mean (Pm) to obtain a Ratio.

Annual Mean obtained from Air Quality Archive Web Site			
Long Term Site	Annual Mean 2009 (Am)	Period Mean 2009 (Pm)	Ratio (Am/Pm)
Brighton Preston Park (Urban Background)	19	21	0.905
Horley (Urban Background)	26	27.3	0.952
Portsmouth (Urban Background)	22	24.2	0.909
		Average (R_a)	0.922

Short Term Site	Mean NO ₂ Jan to Dec 2009 = (A)	Bias Corrected = (A)*0.84 = (B)	Best Estimate =(B)*0.922(R _a)
Bus Stop Keymer Road Hassocks	58.8	49.4	45.5

NO₂ results at Stonepound crossroads area Hassocks 2008

The NO₂ annual mean from 3 long term continuous monitors was obtained for 2008 from the Air Quality Archive web site:- <http://www.airquality.co.uk>

The monitors lie within a 50 mile radius of the Stonepound, Hassocks area.

The annual mean (Am) was then divided by the period mean (Pm) to obtain a Ratio.

Annual Mean obtained from Air Quality Archive Web Site			
Long Term Site	Annual Mean 2008 (Am)	Period Mean 2008 (Pm)	Ratio (Am/Pm)
Brighton Preston Park (Urban Background)	20	19	1.053
Horley (Urban Background)	27	26.6	1.015
Portsmouth (Urban Background)	23	22.8	1.009
		Average (R_a)	1.025

The average of these Ratios (R_a) is then multiplied by the measured diffusion tube value to obtain the estimated annual mean.

Short Term Site	Mean NO₂ July to Dec 2008 = (A)	Bias Corrected = (A)*0.87 = (B)	Best Estimate =(B)*1.025(R_a)
Bus Stop Keymer Road Hassocks	52.0	45.2	46.4
Lamp post Keymer Road Hassocks	48.4	42.1	43.2
Bus Stop London Road Hassocks	47.6	41.4	42.4
Traffic Light Sign London Road Hassocks	44.1	38.4	39.3
Façade of residential premises Brighton Road Hassocks	29.7	25.8	26.5
Lamp Post Brighton Road Hassocks	28.0	24.4	25.0
Bus Stop Brighton Road Hassocks	36.0	31.3	32.1
Lamp Post Hurst Road Hassocks	25.0	21.8	22.3