

# Updating and Screening Assessment of Air Quality in the District of Thanet

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## Executive Summary

An Updating and Screening Assessment of air quality has been carried out for the District of Thanet. This is a requirement of Part IV of the Environment Act 1995, which obliges local authorities to periodically, review and assess the current, and likely future, air quality in their area. The role of this process is to identify areas where it is unlikely that the air quality objectives will be achieved. These locations must then be designated as Air Quality Management Areas (AQMAs). The first round of review and assessment was completed for the District of Thanet in 2000. No potential exceedences of the air quality objectives were identified and therefore no AQMAs were declared. This report is the initial stage of the second round of review and assessment. It focuses on changes that have occurred since the previous round.

The conclusions of this report are that no potential exceedences of the air quality objectives have been identified within the District of Thanet. Therefore, the second round of review and assessment is complete and no further action is required for sources of carbon monoxide, benzene, 1,3-butadiene, lead, sulphur dioxide, nitrogen dioxide and PM<sub>10</sub>. The third round of review and assessment is due to begin in 2006, until progress reports on air quality in the District will be completed each year, which will report monitoring data and any significant changes to sources of air pollution.

### Summary of the Conclusions of the Updating and Screening Assessment

Pollutant	Conclusion
Carbon monoxide	No further action required
Benzene	No further action required
1,3 butadiene	No further action required
Lead	No further action required
Nitrogen dioxide	No further action required
Sulphur dioxide	No further action required
PM <sub>10</sub>	No further action required

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# 1 Introduction

## Introduction to the Second Round of Review and Assessment

- 1.1 The Government's Air Quality Strategy for England, Scotland, Wales and Northern Ireland<sup>1</sup> and the addendum to it, published in February 2003<sup>2</sup> set out a framework for air quality improvements, which includes a series of air quality objectives. National and international measures are likely to achieve these objectives in most locations, but where areas of poor air quality remain, local air quality management will be necessary. Part IV of the Environment Act 1995 requires local authorities to periodically review and assess the current, and likely future, air quality in their area. The role of this process is to identify areas where it is unlikely that the air quality objectives will be achieved. These locations must be designated as Air Quality Management Areas (AQMAs) and subject to active management.
- 1.2 Air quality will change in response to changes in emitting activities. Air quality objectives and Review and Assessment guidance change with advances in knowledge; much of which is learnt from the Review and Assessment process itself. As a result, Review and Assessment is a long-term, rolling process, structured as a series of 'rounds'. Most local authorities in England, Scotland and Wales have now completed the first round of Review and Assessment and the second round is currently underway.
- 1.3 The revised Local Air Quality Management Technical Guidance (LAQM. TG(03))<sup>3</sup> sets out a phased approach to Review and Assessment. This prescribes an initial Updating and Screening Assessment (USA), which all authorities must undertake. It is based on a checklist to identify any matters that have changed since the first round and may now require further assessment. The Updating and Screening Assessment should cover each of the following:
- Any new monitoring data.
  - Any new objectives.
  - Any new pollutant sources, or significant changes to existing sources, either locally or in neighbouring authorities.
  - Any other local changes that might affect air quality.

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If the USA identifies any potential areas where there is a risk that the objectives may be exceeded, which were not identified in the first round, then the Local Authority should progress to a Detailed Assessment (DA).

- 1.4 This report describes the USA for Thanet District Council. It aims to identify any potential exceedences of the air quality objectives. Such exceedences might result from changes in pollutant emissions, or they might be caused by pollutant sources not previously assessed or changes in the objectives themselves.

### **The Air Quality Objectives**

- 1.5 The Government's Air Quality Strategy<sup>1</sup> defines both standards and objectives for each of a range of air pollutants. The 'standards' are set as concentrations below which health effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of a particular pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of the costs, benefits, feasibility and practicality of achieving the standards. The objectives are prescribed within The Air Quality (England) Regulations 2000<sup>4</sup> and The Air Quality (England) (Amendment) Regulations 2002<sup>5</sup>. This latter publication set revised, more stringent objectives for benzene and carbon monoxide which are relevant to this second round, but which were absent in the first. Table 1 summarises the objectives, which are relevant to this report. Appendix 1 sets out the individual health effects of each of these "strategy pollutants".
- 1.6 These air quality objectives are only applicable where members of the public are likely to be regularly present and are likely to be exposed over the averaging time of the objective<sup>3</sup>. For annual mean and 24-hour objectives relevant exposure is limited to residential properties, schools and hospitals. The 1-hour and 15-minute objectives apply at these and at any outdoor location where a member of the public might reasonably be expected to stay for the averaging period of the objective, such as shopping streets, parks and sports grounds, as well as bus stations and railway stations that are not fully enclosed.

**Table 1: Air Quality Objectives Relevant to This Report.**

<b>Pollutant</b>	<b>Time Period</b>	<b>Objective</b>	<b>To be achieved by<sup>1</sup></b>
Benzene	Running annual mean	16.25 µg/m <sup>3</sup>	2003
	Annual mean	5 µg/m <sup>3</sup>	2010
1,3-Butadiene	Running annual mean	2.25 µg/m <sup>3</sup>	2003
Carbon Monoxide	Maximum daily running 8-hour mean	10 mg/m <sup>3</sup>	2003
Lead	Annual mean	0.5 µg/m <sup>3</sup>	2004
	Annual mean	0.25 µg/m <sup>3</sup>	2008
Nitrogen Dioxide	1-hour mean	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	2005
	Annual mean	40 µg/m <sup>3</sup>	2005
Sulphur Dioxide	1-hour mean	350 µg/m <sup>3</sup> not to be exceeded more than 24 times a year	2004
	24-hour mean	125 µg/m <sup>3</sup> not to be exceeded more than 3 times a year	2004
	15-minutes mean	266 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	2005
Fine particles (PM <sub>10</sub> ) <sup>2</sup>	24-hour mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	2004
	Annual mean	40 µg/m <sup>3</sup>	2004
	24-hour mean <sup>3</sup>	50 µg/m <sup>3</sup> not to be exceeded more than 7 times a year	2010
	Annual mean <sup>3</sup>	20 µg/m <sup>3</sup>	2010

<sup>1</sup> The achievement dates are all by the end of the specified year.

<sup>2</sup> Measured by the gravimetric method.

<sup>3</sup> Provisional objectives not included in the Regulations.

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### **Summary of the First Round of Review and Assessment**

- 1.7 Reports from the first round of Review and Assessment are summarised in Appendix 2. Stage one indicated that benzene, 1,3-butadiene and lead were likely to meet the air quality standards throughout the district, but that carbon monoxide, nitrogen dioxide, PM<sub>10</sub> and sulphur dioxide required further investigation. The stage 2 report<sup>6</sup> concluded that there were no significant sources of lead, nitrogen dioxide or sulphur dioxide. The only potentially significant source identified was an MoD fire training facility, which required further assessment for PM<sub>10</sub>. The appraisal of the stage 2 report, carried out on behalf of Defra rejected the conclusions for nitrogen dioxide and PM<sub>10</sub>. Further correspondence satisfied the appraiser that nitrogen dioxide from road traffic would not lead to an exceedence of the objective. An assessment of a similar fire training ground in Chorley was used to conclude that the PM<sub>10</sub> objectives were unlikely to be exceeded in Thanet and the conclusions accepted were by the Defra's appraiser.

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## 2 Methodology

- 2.1 Air pollutant concentrations in the vicinity of an emission source will be related to both the source strength and the background concentration. Interpolated background concentrations of the strategy pollutants have been produced from the national map of background concentrations available from the Air Quality Archive on the internet<sup>7</sup>. These maps of the District of Thanet and the whole of Kent are presented in Appendix 3.
- 2.2 The results of the air quality monitoring carried out in the District of Thanet are published on the internet as part of the Kent & Medway Air Quality Network (KMAQN)<sup>8</sup>, which is maintained by the Kings College London, Environment Research Group (ERG). Some of the sites that are reported as part of this network are also part of the Government's Automatic Urban and Rural Network (AURN)<sup>7</sup>. Results from the KMAQN are summarised in Appendix 4. Powergen operates monitoring stations in Gillingham and Rochester, to inform the air quality management plan for Kingsnorth Power Station<sup>9</sup>. The results from which are included in Appendix 4, along with the data from a site at Wormdale, where monitoring was discontinued in 2001. The locations of all the monitoring sites are shown in Appendix 5. Thanet District Council also operates a monitoring site, at Manston Airport the results from which are also included in this report.
- 2.3 Trunk road traffic flow data have been obtained from the National Atmospheric Emissions Inventory<sup>10</sup>. Traffic data for other roads have been acquired from Babtie, who maintain this information on behalf of Kent County Council. The measured traffic data have been projected forward to 2005 and 2010 using local growth factors obtained from TEMPRO v4.2.1 combined with National Road Traffic Forecast data, as recommended by Babtie.
- 2.4 Using the Design Manual for Roads and Bridges screening method V1.01 (Feb'03)<sup>11</sup>, nomograms which predict the traffic flow needed to create a potential exceedence of the NO<sub>2</sub> and PM<sub>10</sub> objectives for a range of background concentrations have been generated using generally worst-case road conditions, (see Appendix 6). These have facilitated an initial screening of the traffic flow data in order to identify which roads might create an exceedence of the air quality objectives for NO<sub>2</sub> and PM<sub>10</sub> given the local background concentrations. Where potential exceedences of the objectives have been identified, detailed DMRB

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calculations have been carried out for these specific locations. Spreadsheets containing the input data used in these calculations are available.

2.5 Lists of industrial processes obtained from the Environment Agency and held by the District Council, have been used to identify point source emissions within the District of Thanet. The Environment Agency regulates large industrial processes, known as Part A1 sources. Smaller industrial sources, which are known as Part A2 and Part B processes, are regulated by Thanet District Council. Point sources in neighbouring Local Authority areas have also been taken into account by way of correspondence with Canterbury and Dover District Councils. New or changed processes have been checked against the list of potentially significant processes that are set out in the Technical Guidance<sup>3</sup>. Large petrol stations, a list of which is also held by the District, were screened using the criteria, which are prescribed in the Technical Guidance<sup>3</sup>.

2.6 The occurrence of other potential sources of air pollutants in the area, such as airports, railway sidings, bus stations, large boilers and fugitive sources of PM<sub>10</sub> has been identified using local knowledge and screened using the criteria set out in the Technical Guidance<sup>3</sup>.

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## 3 Updating and Screening of Carbon Monoxide

### Updating and Screening Summary for Carbon Monoxide.

Source, location or data which need to be assessed	Action
New monitoring data	No further action required
Very busy roads or junctions in built up areas	No further action required

#### New monitoring data

- 3.1 There has been no monitoring of carbon monoxide carried out within the District of Thanet. Monitoring has been carried out as part of the KMAQN at a background location in Medway and near to the roadside in Canterbury, Maidstone and Sevenoaks. The results, which are set out in Appendix 4, show that there have been no measured exceedences of the objective, which is a maximum daily running 8-hour concentration of greater than 10 mg/m<sup>3</sup> to be achieved in 2003, at any of these locations. The Maidstone roadside monitoring site is near to a junction which is much busier than any of the junctions in the District Thanet. As no exceedence of the objective was measured at this location and concentrations are expected to continue to decline it is unlikely that there will be any exceedence of the objective in the District of Thanet.

#### Very busy roads or junctions in built-up areas

- 3.2 Monitoring data from across the country indicate that the carbon monoxide objective is only likely to be exceeded near to 'very busy' roads and junctions<sup>1</sup>, where the 2003 background concentration is greater than 1 mg/m<sup>3</sup>. The highest estimated background concentration is 0.344 mg/m<sup>3</sup>. This confirms that the objective will be achieved at all locations within the District.

#### Conclusion

- 3.3 No further action required for carbon monoxide.

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<sup>1</sup> 'Very busy' junctions are defined as single carriageways with greater than 80,000 vehicles per day, dual carriageways with greater than 120,000 vehicles per day or motorways with more than 140,000 vehicles per day

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## 4 Updating and Screening of Benzene

### Updating and Screening Summary for Benzene.

Source, location or data which need to be assessed	Action
New monitoring data	No further action required
Very busy roads or junctions in built-up areas	No further action required
Industrial sources	No further action required
Petrol stations	No further action required
Major petroleum storage depots	No further action required

### New monitoring data

- 4.1 Monitoring of benzene using diffusion tubes has been carried out at a number of sites in the District of Thanet, as well as other locations in the KMAQN, the results of which are shown in Figure 1 and Appendix 4. Thanet District Council also operates a continuous benzene monitoring site at a background location near to Manston Airport. The locations of these sites are shown in Appendix 5. Details of the laboratory that supplies and analyses the tubes, and QA/QC measures used are detailed in Appendix 7.
- 4.2 The results presented in Figure 1 show the decrease in benzene concentrations in recent years, brought about by the reduction of the concentration of benzene permissible in petrol. Concentrations in 2003 and 2010 have been estimated by projecting forward measured values for 2002 using factors in the Technical Guidance<sup>3</sup>. These results also indicate that the annual mean benzene objectives of 16.25  $\mu\text{g}/\text{m}^3$  in 2003 and 5  $\mu\text{g}/\text{m}^3$  in 2010 will be achieved at the locations where monitoring has been carried out within Kent. During 2002 the annual mean concentration measured at the Manston Airport site was 0.69  $\mu\text{g}/\text{m}^3$ , which indicates that the airport is not a significant source of benzene.

### Very busy roads or junctions in built-up areas

- 4.3 Monitoring data from across the country indicate that the benzene objective for 2010 is only likely to be exceeded near to 'very busy' roads and junctions<sup>2</sup>, where the 2010 background concentration is greater than 2  $\mu\text{g}/\text{m}^3$ . The highest estimated background concentration is 0.299  $\mu\text{g}/\text{m}^3$ . This confirms that the objective will be achieved at all locations within the District.

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### **Industrial sources**

- 4.4 No industrial processes were found to emit significant quantities of benzene in the previous round of Review and Assessment. There have been no new processes introduced and no significant changes to existing industrial processes either in the District of Thanet or nearby in neighbouring authorities. Therefore there continues to be no likely exceedence of the benzene objective.

### **Petrol stations**

- 4.5 Petrol stations are only likely to lead to an exceedence of the 2010 objective for benzene if they have a large throughput of petrol (greater than 2 million litres per annum) and are near to a busy road, with more than 30,000 vehicles per day. There must also be relevant exposure, i.e. a residential property, within 10 m of the petrol pumps. There are no petrol stations within the District of Thanet that fulfil these criteria, and therefore it is not likely that petrol stations will lead to an exceedence of the benzene objectives in 2003 or 2010.

### **Major fuel storage depots (petroleum only)**

- 4.6 There are no major petrol storage depots in the District of Thanet. The fuel storage depot at Manston Airport handles only aviation fuel, which does not contain significant quantities of benzene.

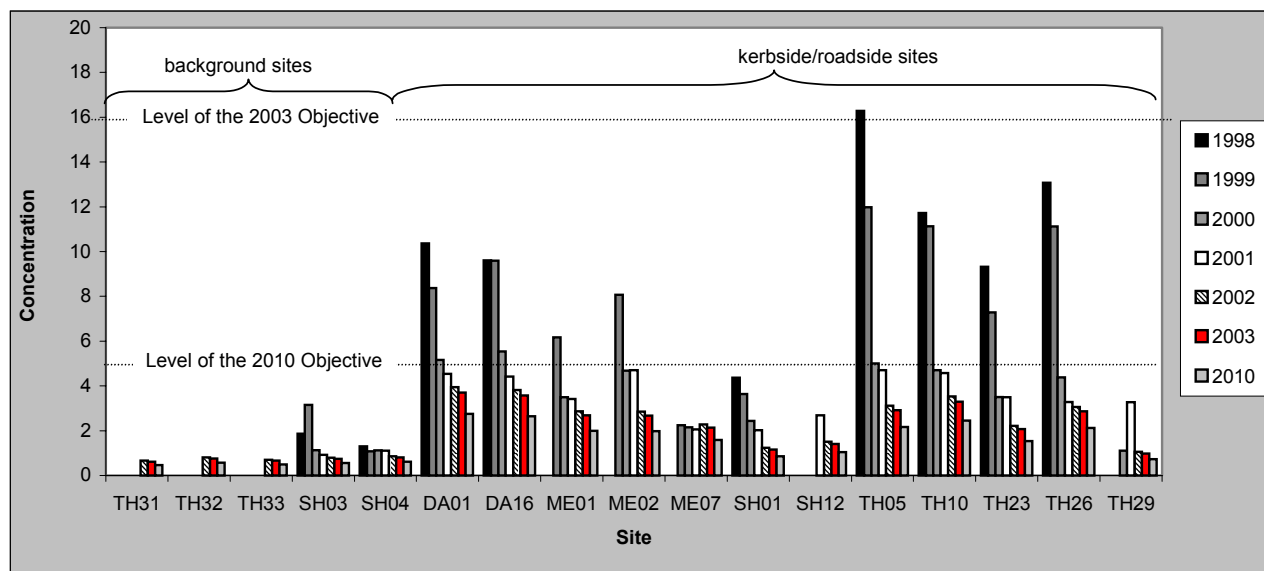
### **Conclusion**

- 4.7 No further action required for benzene.

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<sup>2</sup> 'Very busy' junctions are defined as single carriageways with greater than 80,000 vehicles per day, dual carriageways with greater than 120,000 vehicles per day or motorways with more than 140,000 vehicles per day

**Figure 1 Annual Mean Benzene Concentrations ( $\mu\text{g}/\text{m}^3$ ) Measured at Locations in the KMAQN and Estimated for 2003 and 2010**



TH31= High St Manston, TH32= Bell Davies Drive, Manston, TH33= Hill House Drive, Manston, SH03= Bodenham Road, Folkestone, SH04= Whitecliff Way, Folkestone, DA01= Lowefield St, Dartford, DA16= Princes Road, Dartford, ME01= High St, Rainham, ME02= High St, Strood, ME07= Hollywood Ln, Strood, SH01= Cheriton Pl, Folkestone, SH12= Cheriton Rd, Folkestones, **TH05= The Broadway, Broadstairs**, TH10= College Rd, Margate, TH23= Cecil Square, Margate, TH26= King St, Ramsgate, TH29= Derwent Avenue, Ramsgate Sites marked in bold are those in the District of Thanet

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## 5 Updating and Screening of 1,3-butadiene

### Updating and Screening Summary for 1,3-butadiene.

Source, location or data which need to be assessed	Action
New monitoring data	No further action required
New industrial sources	No further action required
Existing industrial sources with significantly increased emissions	No further action required

#### New monitoring data

- 5.1 There has been no monitoring of 1,3-butadiene carried out within the District of Thanet or anywhere else in the KMAQN. Monitoring has been carried out as part of the national AURN at Marylebone Road (kerbside), University College (roadside) and Eltham (suburban), London and at a rural location in Harwell. The results, which are set out in Appendix 4, show that the running annual mean objective of 2.25 µg/m<sup>3</sup> in 2003 is expected to be achieved at all of these locations. As there are no particular sources of 1,3-butadiene in Thanet, other than road traffic, it would be fair to assume that the objective will not be exceeded in the District.

#### New industrial sources

- 5.2 No new processes, which handle 1,3-butadiene, have been introduced in or near to the District of Thanet since the first round of review and assessment.

#### Existing industrial sources with significantly increased emissions

- 5.3 No industrial processes in or near to the District of Thanet were found to emit 1,3-butadiene in the first round of Review and Assessment.

#### Conclusion

- 5.4 No further action required for 1,3-butadiene.

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## 6 Updating and Screening of Lead

### Updating and Screening Summary for Lead.

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required

### New monitoring data outside an AQMA

- 6.1 There has been no new monitoring of lead carried out within the District of Thanet or anywhere else in the KMAQN. Monitoring has been carried out as part of the national AURN at kerbside sites in London and Cardiff and a background site, London Brent. The results, which are set out in Appendix 4, show that the annual mean objectives of  $0.5 \mu\text{g}/\text{m}^3$  in 2004 and  $0.25 \mu\text{g}/\text{m}^3$  in 2008 are expected to be achieved at all of these locations. As there are no particular sources of lead in Thanet, it would be fair to assume that the objective will not be exceeded in the District.

### New industrial sources

- 6.2 No new processes, which emit lead, have been introduced in or near to the District of Thanet since the first round of review and assessment.

### Industrial sources with substantially increased emissions

- 6.3 No industrial processes in or near to the District of Thanet were found to emit significant quantities of lead in the first round of Review and Assessment. None of the existing industrial processes have increased their emissions of this pollutant since the previous assessment.

### Conclusion

- 6.4 No further action required for lead.

## 7 Updating and Screening of Nitrogen Dioxide

### Updating and Screening Summary for Nitrogen Dioxide.

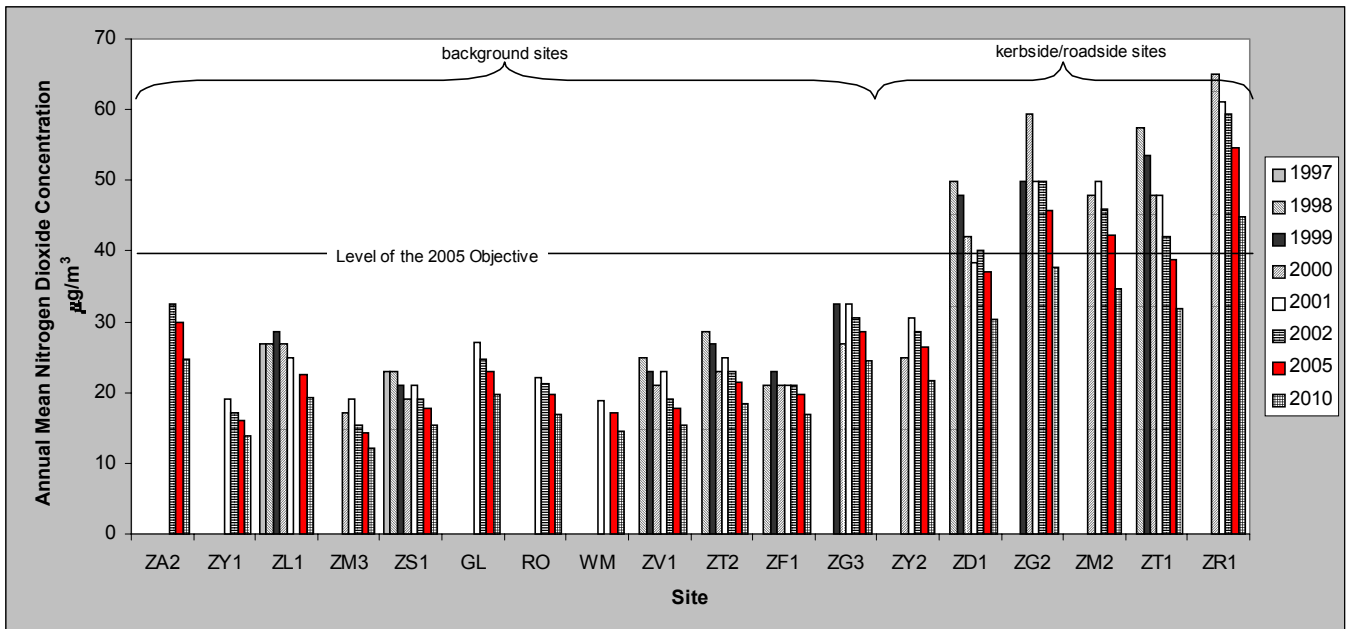
Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New monitoring data within an AQMA	N/A
Narrow congested streets with residential properties close to the kerb	No further action required
Junctions	No further action required
Busy streets where people may spend 1-hour or more close to traffic	No further action required
Roads with high flow of buses and/or HGVs	No further action required
New roads constructed or proposed since first round of Review and Assessment	No further action required
Roads close to the objective during the first round of Review and Assessment	No further action required
Roads with significantly changed traffic flows	No further action required
Bus Stations	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Aircraft	No further action required

### New monitoring data outside an AQMA

- 7.1 Until recently, there has not been any continuous monitoring of nitrogen dioxide carried out by Thanet District Council. However a continuous analyser has now been installed with the urban background PM<sub>10</sub> monitor at Salmestone School, Margate and another placed at a roadside location near to Boundary Road, Ramsgate. However, there is not yet sufficient data to include in this report. Concentrations have also been measured at a sites in Wormdale, Rochester and Gillingham, on behalf of Kingsnorth Power Station. The Powergen results and those for a number of locations, outside the District of Thanet but within the KMAQN, are shown in Figure 2 and Appendix 4. They show that the annual mean objective is likely to be exceeded at some busy roadside locations in Kent.
- 7.2 Nitrogen dioxide has been measured using diffusion tubes at 13 locations in the District of Thanet, all of which are part of the KMAQN. Harwell Scientifics supplies the diffusion tubes and they are analysed by Kent Scientific Services, both of these laboratories use methods for which they hold UKAS accreditation. Further details of the supply, analysis and QA/QC methods are presented in Appendix 7. Studies have indicated that there are systematic differences in the performance of different laboratories and preparation methods of diffusion

tubes. In order to account for any such bias in the diffusion tubes used by Thanet District Council, data from 4 sites where diffusion tubes from the same laboratory have been collocated with continuous monitors for more than 9 months have been examined. Details of this exercise are included in Appendix 8. The results show that the tubes used over-estimated nitrogen dioxide concentrations by around 20%. The diffusion tube results used in this report have therefore been adjusted to account for this bias. Figure 3, shows that measured concentrations of nitrogen dioxide within the District of Thanet are all below the annual mean objective of 40  $\mu\text{g}/\text{m}^3$ . The locations of these monitoring sites are shown in Appendix 5.

**Figure 2 Annual Mean Nitrogen Dioxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) Measured by Continuous Monitor at Locations outside Thanet as part of the KMAQN and Estimated for 2005 and 2010**

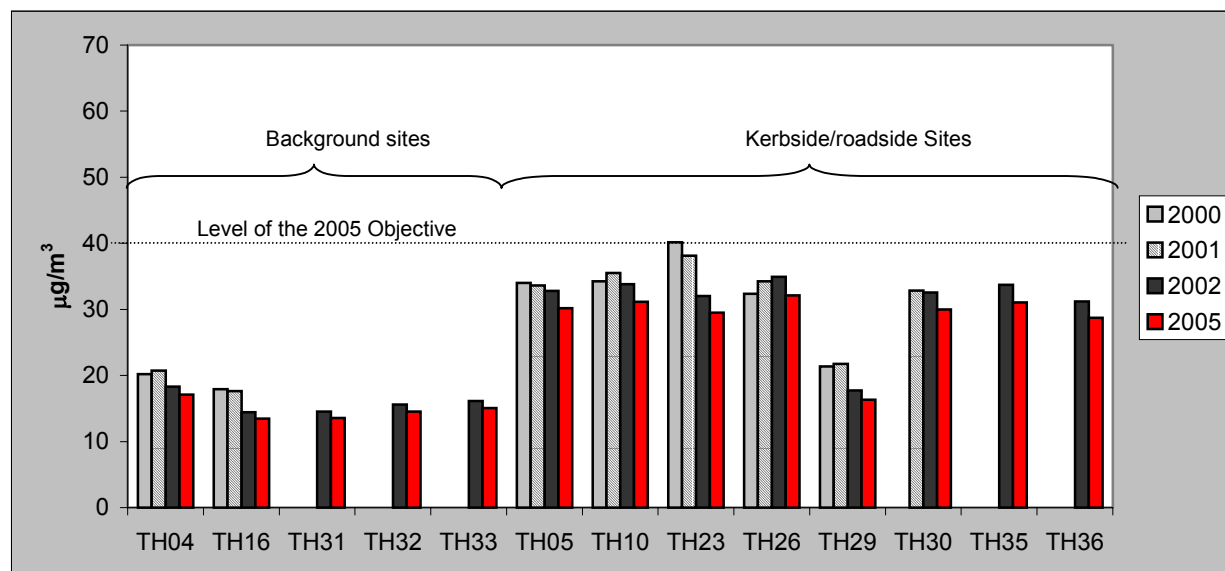


ZA2=Ashford Roadside, ZY1=Canterbury Background, ZY2=Canterbury Roadside, ZR1=Dartford Roadside – St Clements, ZD1=Dover Roadside – Town Hall, ZD2=Dover Roadside 2 – Townwall St, ZD3=Dover Background, ZF1=Folkestone Suburban, ZG1=Gravesham Background, ZG2=Gravesham Roadside, ZG3=Gravesham Industrial Background, ZL1=Luton Background, ZM2=Maidstone Roadside, ZM3=Maidstone Rural, ZS1=Stoke Rural, ZT1=Tonbridge Roadside, ZT2=Tunbridge Wells Background, ZT3=Tunbridge Wells Rural, ZR3= Dartford Roadside - Bean, ZV1= Sevenoaks 2 – Greatness. GL=Gillingham Strand, RO=Rochester, WM=Wormdale.

### New monitoring data within an AQMA

7.3 No AQMAs have been declared for nitrogen dioxide in the District of Thanet and therefore this section is not applicable.

**Figure 3 Annual Mean Nitrogen Dioxide Concentrations ( $\mu\text{g}/\text{m}^3$ ) measured by Diffusion Tube at Locations in Thanet and Estimated for 2005**



TH04= St James' Av, Broadstairs, TH16=Earlsmede Cres, Cliffsend, TH30= Marine Gardens, Margate, TH31= High St, Manston, TH32= Bell Davies Dr, Manston, TH33= Hill House Drive, Manston, TH05= The Broadway, Broadstairs, TH10= College Rd, Margate, TH23= Cecil Sq, Margate, TH26= King St, Ramsgate, TH29= Derwent Av, Ramsgate, TH35= Margate Rd (2), Ramsgate, TH36= Ramsgate Rd, Margate.

#### **Narrow congested streets with residential properties close to the kerb**

- 7.4 Queen Street, Margate and Boundary Road, Ramsgate are both narrow and congested with residential properties close to the kerb. There are busy junctions on both of these roads. Pollutant concentrations are expected to be highest at locations near to these junctions and therefore are dealt with in the next section.

#### **Junctions**

- 7.5 The busiest junctions, with relevant exposure, have been identified as the Marine Terrace/Queen Street junction and the one-way system in the Queens Avenue/Ramsgate Road/College Road area of Margate. On this road system a worst-case receptor has been selected on Eaton Place, which is the closest property to the junction with the highest flow. In Ramsgate, the junction of Boundary Road and Hereson Road was identified. The Square, Birchington was also identified as being a potentially significant junction. Nitrogen dioxide concentrations in 2005 have been calculated at the nearest receptors to these junctions using the DMRB and the results are presented in Table 2. The nitrogen dioxide concentration has also been calculated at the location of diffusion tube TH30, which is in Marine Gardens, near to Queen Street. Marine Terrace/Queen Street and Boundary Road/Hereson Road are canyon

type streets, where the buildings on either side are generally higher than the distance between them. The concentration of nitrogen dioxide calculated to be generated from the road at these sites has been doubled to account for poor dispersion of pollutants at these locations. At the Marine Gardens monitoring location, the concentration calculated using the DMRB method is  $27.6 \mu\text{g}/\text{m}^3$ , whereas the measured concentration at the same location, projected forward to 2005, is  $30.0 \mu\text{g}/\text{m}^3$ . These results show that at this location, the DMRB method may slightly under-estimates nitrogen dioxide concentrations. This could be due to the limited dispersion in a canyon type environment and high emissions from idling traffic caused by congestion. Even taking into account a slight underestimation of the model, the results set out in Table 2 indicate that the annual mean objective of  $40 \mu\text{g}/\text{m}^3$  is unlikely to be exceeded at junctions in the District of Thanet.

**Table 2 Summary of DMRB Calculations for Nitrogen Dioxide**

Receptor Location	Predicted (2005) Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ )
<b>Junctions</b>	
7 Haine Rd, Westwood	29.5
183 Westwood Rd, Westwood	23.4
14-17 Marine Terrace, Margate	34.3*
Marine Gardens diffusion tube site (TH30)	27.6*
9 Park Lane, Birchington	23.9
132 Eaton Rd, Margate	19.4
1 Hereson Road, Ramsgate	27.3*
<b>Objective</b>	<b>40</b>

\*Canyon

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

- 7.6 Queen Street in Margate is a busy shopping street where people could potentially spend an hour or more close to traffic. These locations are only relevant for the 1-hour objective. Monitoring data from across the UK show that if the annual mean nitrogen dioxide objective is expected to be achieved then so will the 1-hour objective. The results in Table 2, show that the annual mean is expected to be achieved at the busiest section of this street and therefore the 1-hour objective will also be achieved.

#### **Roads with high flow of buses and/or HGVs**

- 7.7 According to traffic survey data obtained from Babtie the only road in the District of Thanet with a flow of buses and/or HGVs greater than 25%, is the recently constructed Royal Harbour

Approach Road in Ramsgate. This finding is consistent with local knowledge of the District. A survey in May 2002 determined that 34% of vehicles using the road were HGVs. However, flows on this road are only around 1,000 vehicles per day and there is no relevant exposure within 10m and therefore there is no need for further consideration of this road.

### **New roads constructed or proposed since first round of Review and Assessment**

- 7.8 Royal Harbour Approach, Ramsgate has been opened since the previous round of Review and Assessment. As discussed in the previous section, there is no need to consider emissions from this road further.

### **Roads close to the objective during the first round of Review and Assessment**

- 7.9 During the first round of Review and Assessment, locations near to the Boundary Road/Hereson Road and the Marine Terrace/ Queen Street junctions were identified as being close to the annual mean objective. These junctions have been discussed in paragraph 7.5 of this assessment and it has been determined that there is no further action required for these locations. The busiest roads in the District, away from junctions, have been screened out of this assessment using the nomograms derived from the most recent version of the DMRB (Appendix 6), which includes the latest published emission factors, as shown in Table 3.

**Table 3 Specific Roads Screened Using the Nomograms in Appendix 6.**

<b>Receptors Beside:</b>	<b>NO<sub>2</sub> Objective Exceedence Likely?</b>
St Peters Rd, Margate	No
Ramsgate Rd, Margate	No
Haine Road, Ramsgate	No
Hawley Street, Margate	No
A28 Canterbury Road, Margate	No
A256 Sandwich Road, Margate	No
A253 Monkton, nr Minster	No

### **Roads with significantly changed traffic flows**

- 7.10 By 2005, it is expected that the new Town Centre development at Westwood will be complete. This could lead to an increase in traffic in this area. Details of the percentage change predicted on roads in the area have been taken from the Transportation Assessment<sup>12</sup>, which accompanied the Planning Submission. These changes have been applied to existing traffic survey data and DMRB calculations carried out for worst-case receptors in the area. The

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results are presented in Table 2 and show that the annual mean objective is expected to be achieved at these locations, even when this additional traffic is taken into account.

### **Bus Stations**

- 7.11 There is a bus station in at Westwood, in Thanet. However, this is enclosed and therefore not relevant for consideration in this assessment for local air quality management purposes.

### **New industrial sources**

- 7.12 There have been no new processes, which emit significant quantities of nitrogen dioxide, introduced in or near the District of Thanet since the first round of review and assessment.

### **Industrial sources with substantially increased emissions**

- 7.13 No industrial processes in or near to the District of Thanet were found to emit significant quantities of nitrogen dioxide in the first round of review and assessment. No existing sources have substantially increased emissions.

### **Aircraft**

- 7.14 The only airport in the District of Thanet is Manston Airport. Both passenger and freight flights use this airport. However, the equivalent passenger throughput is less than 5 million passengers per annum, which is the threshold prescribed in the Technical Guidance above which a Detailed Assessment is required. Therefore a Detailed Assessment is not required for nitrogen dioxide emissions from Manston Airport.

### **Conclusion**

- 7.15 No further action is required for nitrogen dioxide.

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## 8 Updating and Screening of Sulphur Dioxide

### Updating and Screening Summary for Sulphur Dioxide.

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New monitoring data within an AQMA	N/A
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Areas of domestic coal burning	No further action required
Small boilers (>5MW(thermal)) burning coal or oil	No further action required
Shipping	No further action required
Railway Locomotives	No further action required

### New monitoring data outside an AQMA

- 8.1 There has been no continuous monitoring of sulphur dioxide carried out in the District of Thanet. However, monitoring is carried out at 10 other locations in Kent as part of the KMAQN. Powergen operates monitoring sites at Rochester and Gillingham as part of an assessment of Kingsnorth Power Station, in the past sulphur dioxide has also been monitored by Powergen at Wormdale, in the Borough of Swale. The results from these sites, along with those from the KMAQN are presented in Appendix 4, and the locations are shown on the map in Appendix 5. These data show the 24-hour and 1-hour objectives have not been exceeded at any of the monitoring locations in Kent, in recent years. In 2001 the monitoring site at Dover recorded 47 15-minute periods above  $266 \mu\text{g}/\text{m}^3$ , the objective is for less than 35 in a year in 2005. The high sulphur dioxide concentrations at this location are due to ships using the port of Dover.

### Monitoring data within an AQMA

- 8.2 No AQMAs have been declared for sulphur dioxide in the District of Thanet and therefore this section is not applicable.

### New industrial sources

- 8.3 There have been no new processes, which emit significant quantities of sulphur dioxide, introduced in or near the District of Thanet since the first round of review and assessment.

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### **Industrial sources with substantially increased emissions**

- 8.4 No industrial processes in or near to the District of Thanet were found to emit significant quantities of sulphur dioxide in the first round of review and assessment. None of the existing processes have substantially increased their emissions.

### **Areas of domestic coal burning**

- 8.5 There are no areas of the District of Thanet where there is a high density of domestic coal burning.

### **Small boilers (>5MW(thermal)) burning coal or oil**

- 8.6 The existence of any schools, hospitals or other large institutional or commercial buildings, which may have boilers using coal or heavy fuel oil has been determined using local knowledge. There are no such boilers, within or near to the District of Thanet.

### **Shipping**

- 8.7 There are approximately 4,800 sailings from Ramsgate Port per year. This is below the criteria of 5,000 movements suggested in the Technical Guidance. Therefore, it is unlikely that these ships will have a significant impact on sulphur dioxide concentrations at properties near to the berths at Ramsgate and therefore a Detailed Assessment is not required for this pollutant.

### **Railway Locomotives**

- 8.8 Locomotives using the sidings at Ramsgate Station are electric and therefore do not emit sulphur dioxide.

### **Conclusion**

- 8.9 No further action is required for sulphur dioxide.

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## 9 Updating and Screening of Particles (PM<sub>10</sub>)

### Updating and Screening Summary for PM<sub>10</sub>.

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New monitoring data within an AQMA	N/A
Junctions	No further action required
Roads with high flow of buses and/or HGVs	No further action required
New roads constructed or proposed since first round of Review and Assessment	No further action required
Roads close to the objective during the first round of Review and Assessment	No further action required
Roads with significantly changed traffic flows	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Areas with domestic solid fuel burning	No further action required
Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc	No further action required
Aircraft	No further action required

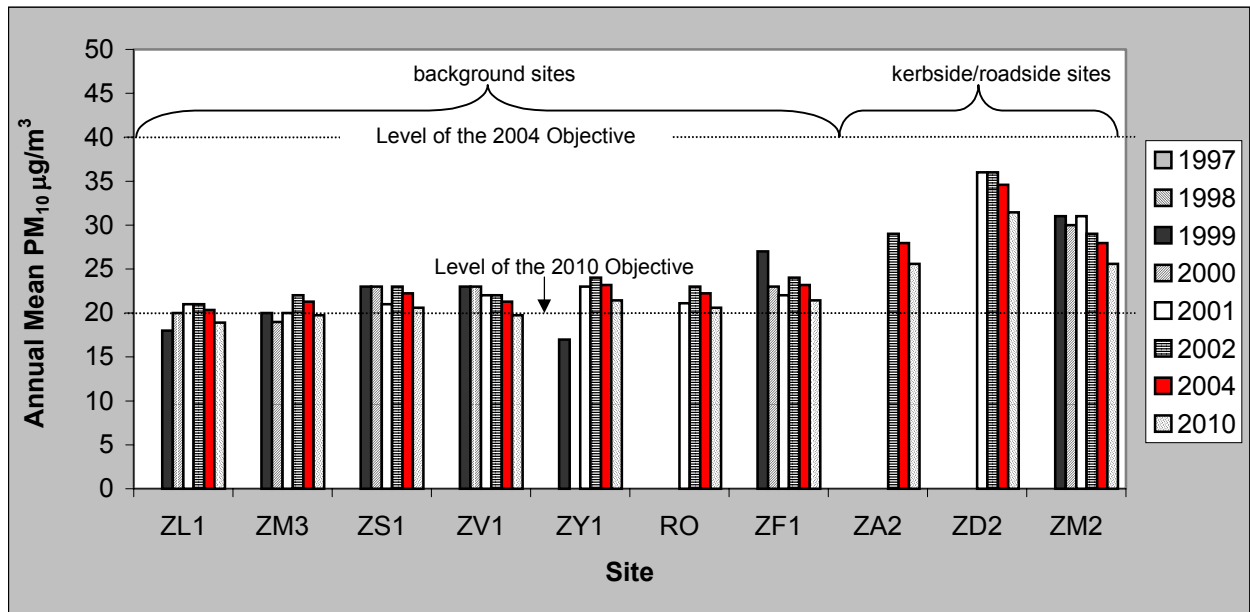
### New monitoring data outside an AQMA

- 9.1 Thanet District Council has carried out monitoring of PM<sub>10</sub> at Salmestone School in Margate, however the type of instrument used is not suitable for comparison with the current objectives. The Council has recently purchased another PM<sub>10</sub> monitor which has been installed at a roadside location near to Boundary Road, Ramsgate, however, there is not yet sufficient data available for use in this assessment. Powergen has carried out some monitoring near Wormdale on behalf of Kingsnorth Power Station. Results from this site and a number of other locations, outside the District of Thanet and within the KMAQN are shown in Figures 4 and 5, and Appendix 4. The results show that there have been no measured exceedences of the annual mean objective of 40 µg/m<sup>3</sup> in Kent, however the 24-hour objective is unlikely to be met at the Dover roadside monitoring site.

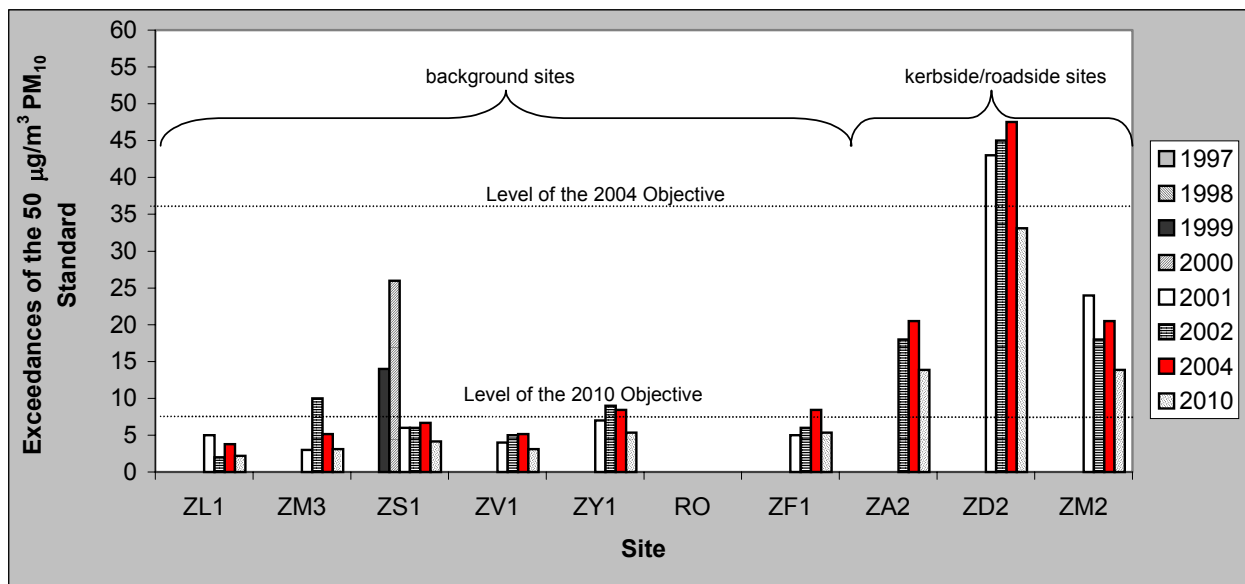
### New monitoring data within an AQMA

- 9.2 No AQMAs have been declared for PM<sub>10</sub> in the District of Thanet and therefore this section is not applicable.

**Figure 4 Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) Measured at Locations outside Thanet as part of the KMAQN and Estimated for 2004 and 2010**



**Figure 5 Exceedences of the 24-hour PM<sub>10</sub> Objective of 50 µg/m<sup>3</sup> Measured at Locations outside Thanet as part of the KMAQN and Estimated for 2004 and 2010**



ZA2=Ashford Roadside, ZY1=Canterbury Background, ZD2=Dover Roadside 2 – Townwall St, ZF1=Folkestone Suburban, ZL1=Luton Background, ZM2=Maidstone Roadside, ZM3=Maidstone Rural, ZS1=Stoke Rural, ZV1= Sevenoaks 2 – Greatness, RO=Rochester.

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## **Junctions**

- 9.3 The busiest junctions, with relevant exposure, have been identified as the Marine Terrace/Queen Street junction and the one-way system, in the Queens Avenue/Ramsgate Road/College Road area of Margate. On this road system a worst-case receptor has been selected on Eaton Place, which is the closest property to the junction with the highest flow. In Ramsgate, the junction of Boundary Road and Hereson Road was identified. The Square, Birchington was also identified as being a potentially significant junction. PM<sub>10</sub> concentrations in 2004 and 2010 were calculated at the nearest receptors to these junctions using the DMRB and the results are presented in Table 4. Results from the DMRB suggest that the 2004 objectives of 40 µg/m<sup>3</sup> as an annual mean and less than 36 days with the 24-hour average concentration greater than 50 µg/m<sup>3</sup> will be achieved. Annual mean concentrations in 2010 may be slightly above the provisional objective of 20 µg/m<sup>3</sup>, and the 24-hour objective of less than 8 days with a concentration greater than 50 µg/m<sup>3</sup>, which is expected to be the case at a large number of locations across the UK. However, the 2010 objectives are currently provisional and do not need to be considered for the purposes of this assessment. No junctions have been identified in the District of Thanet where the 2004 PM<sub>10</sub> objectives are likely to be exceeded.

## **Roads with high flow of buses and/or HGVs**

- 9.4 According to traffic survey data obtained from Babtie the only road in the District of Thanet with a flow of buses and/or HGVs greater than 25%, is the recently constructed Royal Harbour Approach Road in Ramsgate. These findings are consistent with local knowledge of the District. A survey in May 2002 determined that 34% of vehicles using the road were HGVs. However, flows on this road are only around 1,000 vehicles per day and there is no relevant exposure within 10m of the road and therefore there is no need for further consideration of this road.

**Table 4 Summary of DMRB Calculations For PM<sub>10</sub>.**

Receptor Location	2004	2004	2010	2010
	Predicted Annual Mean Concentration (µg/m <sup>3</sup> )	Predicted Number of Exceedences of 50 µg/m <sup>3</sup> as a 24-Hour Mean	Predicted Annual Mean Concentration (µg/m <sup>3</sup> )	Predicted Number of Exceedences of 50 µg/m <sup>3</sup> as a 24-Hour Mean
7 Haine Rd, Westwood	26.8	17	22.0	6
183 Westwood Rd, Westwood	22.4	7	19.4	3
14-17 Marine Terrace, Margate	23.6	9	19.9	3
Marine Gardens diffusion tube site (TH30)	21.7	5	18.5	2
9 Park Lane, Birchington	23.7	10	19.5	3
132 Eaton Rd, Margate	20.3	4	18.1	1
1 Hereson Road	21.4	5	18.9	2
<b>Objective</b>	<b>40</b>	<b>35</b>	<b>20</b>	<b>7</b>

**New roads constructed or proposed since first round of Review and Assessment**

9.5 Royal Harbour Approach, Ramsgate has been opened since the previous round of Review and Assessment. As discussed in the previous section, there is no need to consider emissions from this road further.

**Roads close to the objective during the first round of Review and Assessment**

9.6 During the first round of Review and Assessment, locations near to the Boundary Road/Hereson Road and the Marine Terrace/ Queen Street junctions were identified as being close to the 24-hour objective. These junctions have been discussed in paragraph 9.3 of this assessment and it was determined that there is no further action required for these locations. The busiest roads in the District, away from junctions, have been screened out of this assessment using the nomograms derived from the most recent version of the DMRB (Appendix 6), which includes the latest published emission factors, as shown in Table 5.

**Table 5 Specific Roads Screened Using the Nomograms in Appendix 6.**

Receptors Beside:	PM <sub>10</sub> Objective Exceedence Likely?
St Peters Rd, Margate	No
Ramsgate Rd, Margate	No
Haine Road, Ramsgate	No
Hawley Street, Margate	No
A28 Canterbury Road, Margate	No
A256 Sandwich Road, Margate	No
A253 Monkton, nr Minster	No

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### **Roads with significantly changed traffic flows**

- 9.7 By 2005, it is expected that the new Town Centre development at Westwood will be complete. This could lead to an increase in traffic in this area. Details of the percentage change predicted on roads in the area have been taken from the Transportation Assessment<sup>12</sup>, which accompanied the Planning Submission. These changes have been applied to existing survey data and DMRB calculations carried out for worst-case receptors in the area. The results are presented in Table 4 and show that even if the Westwood development is completed in 2004 the annual mean objective would be expected to be achieved at these locations, even when this additional traffic is taken into account.

### **New industrial sources**

- 9.8 There have been no new processes, which emit significant quantities of PM<sub>10</sub>, introduced in or near to the District of Thanet since the first round of review and assessment.

### **Industrial sources with substantially increased emissions**

- 9.9 No industrial processes in or near to the District of Thanet were found to emit significant quantities of PM<sub>10</sub> in the first round of Review and Assessment. None of the existing sources have substantially increased emissions of PM<sub>10</sub>. There was an increase in activity at the MoD Fire Training Facility during 2002, however this was temporary due to the need to train the armed forces during the firefighters' strike, and it is not anticipated that there will be the same level activity maintained in 2004, when the objectives apply.

### **Areas with domestic solid fuel burning**

- 9.10 There are no areas of the District of Thanet where there is a high density of domestic coal burning.

### **Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc**

- 9.11 There are no quarries, landfill sites or other dusty operations in the District of Thanet that have the potential to have a significant effect on PM<sub>10</sub> concentrations at residential properties.

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### **Aircraft**

- 9.12 The only airport in the District of Thanet is Manston Airport. Both passenger and freight planes use this airport. However, the equivalent passenger throughput is less than 10 million passengers per annum, which is the threshold prescribed in the Technical Guidance above which a Detailed Assessment is required. Therefore a Detailed Assessment is not required for PM<sub>10</sub> emissions from Manston Airport.

### **Conclusion**

- 9.13 No further action is required for PM<sub>10</sub>.

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## Glossary

Standards	A nationally defined set of concentrations for eight pollutants below which health effects do not occur or are minimal.
Objectives	A nationally defined set of concentrations for seven pollutants, incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date, taking into account costs, benefits, feasibility and practicality.
Exceedence	A period of time where the concentration of a pollutant is greater than the appropriate air quality objective.
AQMA	Air Quality Management Area
USA	Updating and Screening Assessment
DA	Detailed Assessment
Defra	Department for Environment Food and Rural Affairs
TG(03)	Technical guidance document provided by Defra to assist local authorities in completion of the next round of the Air Quality Review & Assessment process <sup>3</sup>
DMRB	Design Manual for Roads and Bridges (Highways Agency 2003)
KMAQN	Kent & Medway Air Quality Monitoring Network
PM <sub>10</sub>	Small airborne particles, more specifically particulate matter less than 10 micrometers in aerodynamic diameter.
NO <sub>2</sub>	Nitrogen dioxide.
m	Metres.
µm	Micrometres (one millionth of a metre)
µg/m <sup>3</sup>	Microgrammes per cubic metre.

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## References

- <sup>1</sup> DETR (January 2000), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.
- <sup>2</sup> Defra, (February 2003), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum.
- <sup>3</sup> Defra, (February 2003), Local Air Quality Management, Technical Guidance LAQM.TG(03).
- <sup>4</sup> The Air Quality (England) Regulations 2000, Statutory Instrument 928
- <sup>5</sup> The Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043
- <sup>6</sup> Netcen (March 2000) Air Quality Review and Assessment Stage 2 for Thanet
- <sup>7</sup> [www.airquality.co.uk](http://www.airquality.co.uk)
- <sup>8</sup> [www.seiph.umds.ac.uk/envhealth/kent/k\\_home.htm](http://www.seiph.umds.ac.uk/envhealth/kent/k_home.htm)
- <sup>9</sup> Personal Communication with Kevin Brown, March 2003. Data collected for Kingsnorth Power Station Air Quality Management Plan.
- <sup>10</sup> [www.naei.co.uk](http://www.naei.co.uk)
- <sup>11</sup> Highways Agency (February 2003), Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 Air Quality.
- <sup>12</sup> Denis Wilson Partnership (October 2000), Westwood Cross, Thanet Transportation Assessment