

Mid Suffolk District Council

Environmental Control Section

Upgrading and Screening Assessment of Air Quality in Mid Suffolk

May 2003

Contents

Executive Summary p.3

Introduction p.4

Air Quality Objectives p.5

Methodology p.6

Assessment of Benzene p.7

Assessment of 1,3-butadiene p.10

Assessment of Lead p.12

Assessment of Carbon Monoxide p.14

Assessment of Sulphur Dioxide p.16

Assessment of Nitrogen Dioxide p.19

Assessment of Particulate Matter (PM₁₀) p.27

Conclusions and Recommendations p.33

References p.34

Executive Summary

1. This document represents the 2003 Upgrading and Screening Assessment of air quality in the area of Mid Suffolk.

This is to fulfil a requirement of Part IV of the Environment Act, and Regulations made thereunder. Local Authorities are expected to submit such reports by the end of May 2003.

2. The report follows on from previous assessments (most recently in December 2001), and is the latest document in terms of evaluation of air quality in comparison to objectives introduced by the Air Quality Regulations (2000) and amendment regulations (2002)

3. This report is solely an “Upgrading and Screening Assessment”. The purpose is to evaluate whether any of the pollutants specified in the regulations are likely to be present at levels, which exceed the air quality objectives.

4. The findings of the assessment are that for the majority of the pollutants there is no need to proceed to a more detailed assessment. This is the case for benzene, 1,3-butadiene, lead, carbon monoxide, sulphur dioxide and nitrogen dioxide.

5. It is however recommended that more data be collated in respect of nitrogen dioxide to assist in future assessments.

6. From the information gathered through the Upgrading and Screening Assessment, the only pollutant that may exceed air quality objectives is particulate matter (PM₁₀). It is considered unlikely but possible that the objective may be exceeded at locations along the A14 where residential property is close to the A14. There are five locations where this may be possible.

7. It is not considered necessary, at this stage, to proceed to a detailed assessment of particulate matter emissions in these locations, but a more detailed assessment, including some continuous monitoring is likely to be of value prior to the next upgrading and screening assessment at the end of April 2006.

1.Introduction

1.1 Part IV of the Environment Act (1995) (1) places a duty on Local Authorities to review and assess the air quality in their area.

1.2 Regulations (2) made under the Act detail the pollutants of concern, and the objectives, which must be met.

1.3 The key pollutants are nitrogen dioxide, sulphur dioxide, particulate matter, lead, carbon monoxide, benzene and 1,3-butadiene.

1.4 Previous assessments, undertaken in March 1999, March 2000 and December 2001 have concluded that the air quality objectives will be met within Mid Suffolk.

1.5 However, assessment of air quality is an ongoing requirement, taking into consideration any changes in those factors, which could impact upon air quality. These are principally transport, industrial and commercial sources.

1.6 Recent regulations (3) have amended the air quality standards, and more stringent standards have been introduced for the pollutants carbon monoxide and benzene (see table 2.1) The date for achievement of the objectives varies, but for many of the pollutants the target date is December 2004

1.7 The latest phase in the approach to assessing air quality standards is detailed in guidance issued by The Department for Environment, Food and Rural Affairs (4,5) and Local Authorities are required to carry out an Upgrading and Screening Assessment by the end of June 2003. Following on from this, if it has been identified that any of the key pollutants may exceed the air quality objective, then the Local Authority must proceed to a Detailed Assessment, which should be completed by the end of April 2004.

1.8 Where a Local Authority identifies an exceedance of an air quality objective, then the extent of the area must be identified, and declared as an Air Quality Management Area (AQMA). The Authority must then introduce an air quality action plan, detailing those measures it intends to take in pursuance of the air quality objective.

1.9 This report is solely the Upgrading and Screening Assessment, and is concerned with identifying any areas of concern which may require detailed assessment, and monitoring, in order to determine whether the air quality objectives are being met

1.10 The pollutants of most concern in Mid Suffolk are likely to be nitrogen dioxide and particulate matter, both of which were evaluated in the 2001 assessment, and the recommendation was that both should continue to be monitored.

2. Air Quality Objectives

<u>Pollutant</u>	<u>Air Quality Objective</u>	<u>Measured As</u>	<u>Compliance Date</u>
<u>Benzene</u>	16.25 µg/m ³ 5.0 µg/m ³	<u>Running Annual Mean</u> Annual Mean	<u>31.12.2003</u> <u>31.12.2010</u>
<u>1,3-butadiene</u>	2.25 µg/m ³	<u>Running Annual Mean</u>	<u>31.12.2003</u>
<u>Carbon Monoxide</u>	10 mg/m ³	<u>Maximum Daily Running 8-hour mean</u>	<u>31.12.2003</u>
<u>Lead</u>	0.5 µg/m ³ 0.25 µg/m ³	<u>Annual Mean</u> Annual Mean	<u>31.12.2004</u> <u>31.12.2008</u>
<u>Nitrogen Dioxide</u>	200 µg/m ³ not to be exceeded more than 18 times per year 40 µg/m ³	<u>1-hour mean</u> Annual Mean	<u>31.12.2005</u> <u>31.12.2005</u>
<u>Particulates (PM₁₀)</u>	50µg/m ³ not to be exceeded more than 35 times a year 40µg/m ³	<u>24-hour mean</u> Annual mean	<u>31.12.2004</u> <u>31.12.2004</u>
<u>Sulphur Dioxide</u>	350µg/m ³ not to be exceeded more than 24 times per year 125µg/m ³ not to be exceeded more than 3 times a year 266µg/m ³ not to be exceeded more than 35 times a year	<u>1-hour mean</u> 24-hour mean 15-minute mean	<u>31.12.2004</u> <u>31.12.2004</u> <u>31.12.2005</u>

3. Methodology

3.1 Detailed guidance on the undertaking of the Upgrading and Screening Assessment is provided by DEFRA (5). Local Authorities are expected to make reference to this guidance when undertaking reviews.

3.2 The guidance recommends a logical approach to assessment, identifying potential sources of the individual pollutants, and making reference to data available on background concentrations, measured emissions from industrial sources, and emissions from traffic (based on traffic flow data) to determine locations where air quality objectives may be exceeded.

3.3 Where reference is made to Industrial Processes, the potential impact of premises close to the border of (but not within) Mid Suffolk has also been considered. This was as part of a countywide working group comprising representatives from all Suffolk Local Authorities. It appears unlikely that any industrial processes outside of the Mid Suffolk boundary are likely to impinge upon air quality within the district.

3.4 At the time of compiling this report, Ipswich Borough Council have not completed the review, but there is a possibility that three of their processes may require a more detailed assessment. These are the Vopak terminal in respect of benzene emissions, Cranes and Manganese Bronze in respect of lead emissions. These matters are considered in the relevant sections relating to lead and benzene

3.5 The need to proceed to a detailed assessment can then be based on these findings, and also (where the main source of the pollutant is from road vehicle emissions) by using the “Design Manual for Roads and Bridges” software (6) (developed by the Highways Agency) to predict likely pollutant levels.

3.6 The approach has been to take each pollutant in turn, and to assess whether circumstances have changed such that there is a need to proceed to a more detailed assessment.

4. Assessment of Benzene

Previous Assessments

4.1 Stage 1 Review and Assessment, March 1999 – Guidance issued at the time of the review recommended that “*..only those Authorities with major industrial processes which either handle, store, or emit benzene, which have the potential, in conjunction with other sources to result in elevated levels of benzene in relevant locations, are expected to need to undertake a second or third stage review*”

ICI Paints Division was considered as a potential source, but was considered to be a trivial emitter. The risk of the AQ objective being exceeded was considered negligible.

4.2 Stage 2 Review and Assessment, March 2000 – no review was undertaken, as benzene had not been identified in the Stage 1 review as likely to exceed the Air Quality Objective

4.3 Stage 3 Review and Assessment, December 2001 – repeated the comments of the first stage review.

Review and Assessment May 2003

4.4 The objective for benzene is a running annual mean concentration of $16.25 \mu\text{g}/\text{m}^3$, to be achieved by the end of 2003. There is a further objective, introduced by the amendment to the Regulations, that an annual mean concentration of $5 \mu\text{g}/\text{m}^3$ should be achieved by the end of 2010.

4.5 The main sources of benzene are petrol-engined vehicles, petrol refining, and the distribution and uncontrolled emissions from petrol station forecourts without vapour recovery systems.

4.6 The advice of the technical guidance note is that “*There is no requirement for Authorities to consider road traffic emissions in their review and assessment of the 2003 objective. Only those authorities with relevant locations in the vicinity of major industrial processes that store, handle, or emit benzene, will need to progress beyond the updating and screening assessment for the 2003 objective*”

4.7 As part of the screening assessment, consideration should be given to

- a) Monitoring Data
- b) Road Traffic
- c) Industrial Sources

d) Petrol Stations

e) Major Fuel Storage Depots

4.8 In respect of **monitoring data**, no monitoring for benzene has been undertaken in Mid Suffolk, it has not previously been identified as a pollutant, which warrants a detailed assessment.

Details of average annual background concentrations of pollutants can be obtained from a DEFRA website (7). Reference to this web site revealed that the highest projected annual background value for benzene in Mid Suffolk in 2003 was $0.393 \mu\text{g}/\text{m}^3$ compared to an air quality objective of $16.25 \mu\text{g}/\text{m}^3$, therefore background levels are insignificant.

Similarly, in terms of projected average annual background concentrations for 2010, the highest projected value for Mid Suffolk is $0.311 \mu\text{g}/\text{m}^3$ compared to an air quality objective of $5 \mu\text{g}/\text{m}^3$. Given the extremely low background values there is no need to undertake more detailed monitoring.

4.9 In respect of **road traffic**, the guidance recommends that this only need be considered where there are average daily traffic flows in excess of 80,000 vehicles per day. There are no roads within Mid Suffolk, which meet this criteria (even along the A14 traffic flows are rarely in excess of 40,000 vehicles per day) and this potential source of benzene need not be considered.

4.10 In respect of **industrial sources**, the only site likely to emit benzene within Mid Suffolk is PPG Industries (previously ICI Paints). They were contacted in February 2003 to enquire re. Benzene emissions, and it has recently come to light (information from suppliers) that one of their raw materials (t-butyl benzoate) may break down during the reaction process and emit benzene.

The company are undertaking monitoring at the site boundary, but no quantifiable amount of benzene has been recorded.

Advice was sought from the Government and Devolved Administrations "Helpdesk" in respect of this matter. The advice obtained was that this was an insignificant source, which did not require further investigation, and that only locations in the vicinity of major petrochemical processes were likely to exceed the air quality objective for benzene.

In respect of other industrial processes, there are none within the district that are likely to emit benzene in significant quantities, and no known processes that have developed since the previous review.

4.11 In respect of **petrol stations**, consideration should be given to emissions from those stations with an annual throughput greater than 2 million litres, with a busy road (i.e. more than 30,000 vehicles per day) nearby, and a relevant exposure site within 10m of the pumps.

Exact throughput of the larger stations in the district is not known, but there are 8 “authorised” stations, which are known to have a throughput greater than one million litres per annum, so these were all considered.

They are:

Tesco Filling Station, Stowmarket

Beacon Hill Service Station, Coddenham

Haughley Park Service Station, A14 Westbound, Stowmarket

Norton Service Station

Stowmarket Service Station, Combs Ford

Tothill Services Ltd, A14 Eastbound, Stowmarket

Stowupland Service Station, Thorney Green

Brockford Garage, Wetheringsett-cum-Brockford

Traffic flow data obtained from Suffolk County Council indicates that the only road through Mid Suffolk where number of vehicles exceeds 30,000 is the A14 carriageway.

The only sources of concern therefore are Tothill Services and Haughley Park Service Station, as they are adjacent to the A14, but there is no relevant exposure site within 10m of the pumps at either of these stations.

Therefore, this potential source of benzene is of no significance

4.12 With reference to Appendix E of Annex 2 of the guidance, there are no **major fuel depots** within Mid Suffolk. The Vopak terminal in Ipswich may be investigated further by Ipswich Borough Council, but this is in excess of 10 km from the Mid Suffolk border and of no significance in terms of air quality in Mid Suffolk.

Conclusion

4.13 There is no need to proceed to a detailed assessment of the air quality objective for benzene within Mid Suffolk.

5. Assessment of 1,3- butadiene

Previous Assessments

5.1 Stage 1 Review and Assessment, March 1999 – Guidance recommended that “*..only those Authorities with major industrial processes which either handle, store or emit 1,3-butadiene and which have the potential in conjunction with other sources to result in elevated levels in relevant locations are expected to need to undertake a second or third stage review*”

ICI Paints Division was identified as a possible source, but was considered to be a trivial emitter, and the conclusion of the review was that the air quality objective would be met without intervention.

5.2 Stage 2 Review and Assessment, March 2000 – no review was undertaken, as the Stage 1 review had not identified any likely exceedence of the Air Quality Objective.

5.3 Stage 3 Review and Assessment, December 2001 – any further review was considered unnecessary

Review and Assessment May 2003

5.4 The current objective for 1,3-butadiene remains unchanged, a maximum running annual mean concentration of $2.25 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2003.

5.5 The advice of the guidance note is that “*Only those authorities with relevant locations in the vicinity of major industrial processes which handle, store or emit 1,3-butadiene are expected to proceed beyond the updating and screening assessment*”.

The guidance recommends that the screening and updating assessment should include an assessment of:

- a)Monitoring Data
- b)New Industrial Sources
- c)Industrial Sources with Significantly Increased Emissions

5.6 Reference to the website (7) indicates that the highest estimated annual mean background concentration of 1,3-butadiene at any location within Mid Suffolk for 2001 was $0.177 \mu\text{g}/\text{m}^3$.

The highest estimated annual mean background concentration of 1,3-butadiene at any location in Mid Suffolk for 2003 is 0.151 $\mu\text{g}/\text{m}^3$.

Therefore, background concentrations are well below the objective limit

5.7 No new processes (re. Annex 2, Appendix E of the guidance) with the potential to emit significant quantities of 1,3-butadiene have been developed within Mid Suffolk since the previous air quality review.

5.8 As the only industrial operator thought likely to use 1,3-butadiene, PPG Industries (previously ICI Paints) were contacted to enquire as to usage. Confirmation was received that whilst similar organic compounds may be used on site, there is no storage or usage of 1,3 butadiene.

Conclusion

5.9 Given the low background levels and the fact that there are no known sources of concern within the district in respect of 1,3-butadiene emissions, it is not considered necessary to proceed to a detailed assessment of 1,3-butadiene

6. Assessment of Lead

Previous Assessments

6.1 Stage 1 Review and Assessment, 1 March 1999 – The review concluded that, *“Given the existing low levels of lead, it is the conclusion of Mid Suffolk District Council that there is no need to consider the possibility of an air quality management area for lead”*

6.2 Stage 2 Review and Assessment, March 2000 – no further review was undertaken, as lead had not been identified in the Stage 1 review as likely to exceed the air quality objective

6.2 Stage 3 Review and Assessment, December 2001 – No further assessment was considered necessary.

Review and Assessment May 2003

6.4 There are two relevant standards to consider for lead, an annual mean concentration of $0.5 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2004, and an annual mean concentration of $0.25 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2008.

6.5 The guidance notes that *“only those authorities with relevant locations in the vicinity of major industrial processes that emit significant quantities of lead will need to progress beyond the updating and screening assessment”*

6.6 The screening and updating assessment recommends that consideration be given to

a) Monitoring data,

b) New industrial sources

c) Industrial Sources with substantially increased emissions.

6.7 No monitoring data is available other than from the national network of monitoring sites. These sites cannot be correlated to Mid Suffolk, as they are indicative of industrial and urban areas. Therefore no meaningful data is available in respect of background levels

6.8 No new industrial sources have been developed which have the potential to emit significant quantities of lead.

6.9 The only process previously identified, as a potential source of lead emissions within Mid Suffolk is the aluminium reclamation furnace operated by F A Edwards & Sons at Denham.

This is a small smelting operation, and not “*..a major industrial process emitting significant quantities of lead*” as identified in the guidance

There has been no substantial increase in emissions from this source since previous reviews were undertaken, and the plant runs less frequently (at the moment) than in previous assessment years.

6.10 In respect of processes in neighbouring Authorities, Ipswich B.C may proceed to a more detailed assessment of lead emissions from two of their processes – Cranes and Manganese Bronze. However, both are sufficiently distant so as to have no effect on air quality in Mid Suffolk. Guidance recommends that fugitive emissions only need be considered up to 1km. distant from the source, and that stack emissions (for a stack between 20 and 40m) only need be considered up to 2km. distant from the source. Both factories are beyond 2km. of the Mid Suffolk boundary

Conclusion

6.11 In the light of the above information, it is not considered necessary to proceed to a detailed assessment for lead.

7. Assessment of Carbon Monoxide

Previous Assessments

7.1 Stage 1 Review and Assessment, March 1999 – indicated that there were several potential sources of carbon monoxide emissions adjacent to the Mid Suffolk district, but only two within the area. Based on data collected it was concluded that these industrial processes did not emit sufficient quantities of carbon monoxide to cause the air quality objectives to be exceeded.

7.2 Stage 2 Review and Assessment, March 2000- undertaken because of the predicted increases in traffic levels on the A14. Also, the impact of the major industrial sources of carbon monoxide was considered. These were:

- British Gas PLC, Diss Compressor Station, Eye Airfield
- Climax Molybdenum UK Ltd, Needham Road, Stowmarket

These were re-examined using the Environment Agency guidance method as referred to in Chapter 2 of LAQM TG4(00) (8). It was concluded that the emissions from these sources did not significantly affect air quality within the region – either on their own or with background included (predicted to be less than 0.1 ppm in 2003).

The A14 effect was examined using the DMRB screening model. Kerbside location results were well below the air quality standards.

As the objectives for carbon monoxide were being met it was concluded that no further assessment of this pollutant was necessary.

7.3 Stage 3 Review, December 2001 – no further review was undertaken.

Review and Assessment May 2003

7.4 A tighter objective of 10 mg/m³ (expressed as a maximum daily running 8-hour mean concentration) has been set for carbon monoxide. This to be achieved by the end of 2003. The previous standard was 11.6 mg/m³

7.5 The main source of carbon monoxide is road transport, accounting for 67% of total release in 2000. Emission levels have shown a steady decline since 1970 and current projections are for a fall of some 42% between 2000 and 2005.

7.6 As part of the screening assessment, guidance recommends that consideration should be given to:

Monitoring Data

Road Traffic

7.7 In respect of **monitoring data**, no monitoring for carbon monoxide has been undertaken in Mid Suffolk. It has not previously been identified as a pollutant that warrants a detailed assessment.

Reference to the web site of projected background values (7) indicates that the highest projected annual background value for carbon monoxide in Mid-Suffolk in 2001 was 0.299 mg/m^3 . Thus, background levels are extremely low in comparison with the air quality objective of 10 mg/m^3 .

7.9 In respect of **road traffic**, the guidance recommends that this only need be considered where there are average daily traffic flows in excess of 80,000 vehicles per day, and background concentrations exceed 1 mg/m^3 .

Figures provided by Suffolk County Council show that even on the busiest trunk road in the district (The A14), the highest annual average daily traffic (AADT) in Mid Suffolk is 41,600, comprising 19% heavy goods vehicles. Furthermore, at no location in the district does the background concentration of carbon monoxide exceed 1 mg/m^3 . Thus there are no locations within Mid Suffolk at which the potential for exceedence of the carbon monoxide objective need be considered.

Conclusion

7.10 The low background concentrations of carbon monoxide, and the current traffic flows are such that there is no need to conduct a more detailed assessment of carbon monoxide levels in Mid Suffolk

8. Assessment of Sulphur Dioxide

Previous Assessments

8.1 Stage 1 Review and Assessment March 1999 – Due to the presence of a number of processes, which had the potential to emit significant quantities of SO₂ (Climax Molybdenum, Fibropower, Blue Circle Cement, and two sugar manufacturing plants outside the district). It was considered necessary to “..conduct a second stage review and assessment for SO₂ for potential exposure to individuals in relevant locations arising from major point sources”

8.2 Stage 2 Review and Assessment March 2000 – It was concluded that “*The national strategy targets for sulphur dioxide will be achieved by 2004/2005...A third stage review is not required for sulphur dioxide*”

8.3 Stage 3 Review December 2001 – As identified in the stage 2 review, no further action was necessary

Review and Assessment May 2003

8.4 There are three different objectives to be met in respect of sulphur dioxide, all of which relate to exposure over short periods of time. These objectives are unchanged from the previous review.

8.5 In carrying out the updating and screening assessment, the guidance advises as to those sources, which should be considered in terms of possible exceedences of the objectives.

These are as follows:

- (a) Monitoring Data
- (b) New Industrial Sources
- (c) Industrial sources with Substantially Increased Emissions
- (d) Areas of Domestic Coal Burning
- (e) Small Boilers (>5MW) Burning Oil or Coal
- (f) Shipping
- (g) Railway Locomotives

8.6In respect of **monitoring data**, no monitoring has been undertaken by Mid Suffolk District Council since the last review. Reference to the website (7) shows that data is available for background sulphur dioxide concentrations in 2001, expressed as an annual mean in $\mu\text{g}/\text{m}^3$. The highest recorded value is $6.77 \mu\text{g}/\text{m}^3$.

This data is of limited value as the relevant air quality objectives are expressed over one hour, 24 hours and 15 minutes.

However, as the 15 minute, 1 hour and 24 hour objectives are 266, 350 and $125 \mu\text{g}/\text{m}^3$ respectively, it does confirm that there is no location within Mid-Suffolk where background concentrations of sulphur dioxide are significant.

8.7In respect of **new industrial sources**, no processes which could emit significant quantities of sulphur dioxide have commenced operations within Mid-Suffolk since the previous air quality review.

8.8In respect of **existing industrial processes**, reference to the Public Register of Authorised Processes revealed that there was only one process where sulphur dioxide emissions may have increased. This is at Fibropower, Eye Airfield, and is due to a variation of their Authorisation, to permit the burning of chicken feathers as fuel.

The Authorisation was varied on 22nd January 2002, to permit the use of up to 7% by weight of chicken feathers in the fuel. Trials had indicated that this would increase sulphur dioxide emissions, whilst keeping them below the authorisation threshold. A supporting "Air Quality Assessment Report" by Mott MacDonald (9), using dispersion model ADMS 3.1 was provided to augment the application, and concluded that the AQ objective for sulphur dioxide would not be breached.

The data on the public register supports this statement, the average of the monthly mean values for sulphur dioxide emissions in 2001 was $256 \text{ mg}/\text{m}^3$, since the Authorisation was varied on 22nd January 2002, there has been little change in sulphur dioxide emissions.

Indeed, the average of the monthly mean values for 2002 was $251 \text{ mg}/\text{m}^3$, virtually the same as 2001.

The company have indicated to the Environment Agency that they may make a further application to increase the use of chicken feathers from 7% to 10% by weight. However, no application has been forthcoming.

It can be concluded that there is no substantial increase in sulphur dioxide emissions from this source

8.9In respect of **domestic coal burning**, no data was available from the most recent Mid Suffolk House Condition Survey, but Mid Suffolk is not an area where significant quantities of coal are burnt. There are only two settlements of over 4000 persons, the district is largely rural and sparsely populated.

Guidance recommends that consideration only need be given to those areas where there are more than 100 houses burning solid fuel in an area of 500m x 500m. To build up a picture of domestic coal use across the district, all known coal merchants were contacted with a view to determining any areas of significant coal usage. Unfortunately the response was poor.

Therefore, the Suffolk Air Quality Group (a working group comprising Officers from all Local Authorities within the County) approached the Regional Co-ordinator of the Solid Fuel Association to discuss the air quality review. The response received was that the use of solid fuel in the county had declined, particularly as central heating systems in social housing were being converted to gas and oil-fired boilers.

This view is supported by consideration of Mid Suffolk Council's own housing stock. Solid fuel heating systems are due to be removed from all Council properties by the end of 2003 (in only 12 properties have tenants opted to retain solid fuel heating). There are already approximately 1200 properties, which have been converted to electrical central heating, and approximately 2400 properties served by oil or gas.

It is considered extremely unlikely that there are any areas in Mid Suffolk where the domestic burning of coal will give rise to an exceedence of the air quality objective for sulphur dioxide.

8.10 There are no known small **oil or coal fired boilers** (>5 MW), which require consideration

8.11 Emissions from **coal-fired locomotives** are not considered significant. The only known location where they operate within Mid Suffolk is at the Mid Suffolk Light Railway at Wetheringsett-cum-Brockford.

Reference to the planning conditions relating to this premises shows that they only operate on eight days of the year. There will be no "regular exposure to persons within 15metres of the locomotive". The closest residential properties are considerably further than 15metres from the locomotives. Over the course of a year, the emissions from this source are considered to be insignificant.

8.12 Emissions from **shipping** need not be considered, as this is not an issue in a land-locked local authority.

Conclusion

Consideration of all the appropriate sources indicates that there is no location in Mid Suffolk at which the air quality objective for sulphur dioxide is likely to be exceeded. Thus there is no need to proceed to a detailed assessment for sulphur dioxide.

9. Assessment of Nitrogen Dioxide

Previous Assessments

9.1 Stage 1 Review and Assessment March 1999 – it was considered necessary to proceed to a second stage assessment due to “...*potential exposure to individuals in relevant locations arising from both point sources and the A14 trunk road...*” .

9.2 Stage 2 Review and Assessment March 2000 – it was concluded that “..*there is a significant risk that the air quality objective will be exceeded at locations along sections of the A14 from road traffic emissions..*” Therefore it was considered necessary to conduct a third stage review.

9.3 Stage 3 Review and Assessment December 2001 – following continuous monitoring for a period of 3 months, in a location where it was considered most likely that the air quality objective may be exceeded, it was concluded that “..*air quality objectives for nitrogen dioxide will be met at all of the key locations identified in the Stage 2 assessment*”.

Review and Assessment May 2003

9.4 The air quality objectives for nitrogen dioxide remain unchanged, the annual mean concentration shall not exceed $40\mu\text{g}/\text{m}^3$ and a one-hour mean concentration of $200\mu\text{g}/\text{m}^3$ shall not be exceeded more than 18 times per year. These objectives should be achieved by the end of 2005.

9.5 The principal source of nitrogen oxides (which are readily converted to nitrogen dioxide) is road transport, which in 2000 accounted for 49% of total UK emissions. Other main sources are the electricity supply industry and other industrial sectors

9.6 Therefore, emissions from transport are of prime importance in assessing the objective for nitrogen dioxide. Guidance recommends that the following sources should be considered:

- (a) Monitoring data
- (b) Narrow congested streets with residential properties close to the kerb
- (c) Junctions
- (d) Busy streets where people may spend one hour or more close to traffic
- (e) Roads with high flow of buses and/or HGV's
- (f) New roads constructed or proposed since first round of review and assessment

(g) Roads close to the objective during the first round of review and assessment

(h) Roads with significantly changed traffic flows

(i) Bus Stations

(j) New Industrial Sources

(k) Industrial Sources with Substantially Increased Emissions

(l) Aircraft

9.7 Monitoring Data – the monitoring data that is available consists of the background concentration figures, the results of continuous sampling undertaken during the 3rd Stage review, and an ongoing programme of “passive” sampling by diffusion tubes at 5 locations across the district.

The background figures show that the highest estimated concentration of nitrogen dioxide for 2001 was 24.4 $\mu\text{g}/\text{m}^3$, and the highest estimate for 2005 is 21.3 (expressed as an annual mean value). The air quality objective is 40 $\mu\text{g}/\text{m}^3$, so there is a significant background component to consider, as well as the impact of traffic.

In respect of monitoring data, Mid Suffolk has, for several years monitored nitrogen dioxide by use of passive diffusion tubes at five locations across the district, at background (B), intermediate (I) and roadside (R) sites

The results for 2002 are as follows:

Location	B/I/R	Average Annual NO ₂ $\mu\text{g}/\text{m}^3$ (2002)
The Street, Thornham Magna	B	12.8
High Street Needham Market	R	24
Station Road Claydon	R	30.8
Red Gables Stowmarket	I	20.2
Old Stowupland Road, Stowmarket	R	27.9

(adjacent A14)		
----------------	--	--

The results show that at none of the measured locations are the nitrogen dioxide levels likely to exceed the objective limit – an annual mean of $40\mu\text{g}/\text{m}^3$

Whilst the provision and analysis of these diffusion tubes is undertaken by a NAMAS accredited laboratory (Cassella CRE), the data is somewhat limited as passive diffusion tube sampling can be inaccurate. Therefore, the guidance recommends that an adjustment factor should be used based on a co-location study using a continuous chemiluminescence sampler.

Such a study was undertaken May to July 2001, at Station Road, Claydon, and although of limited duration, a correction factor can be calculated.

The mean value obtained from the continuous monitor was $31\mu\text{g}/\text{m}^3$, the mean value of three diffusion tubes at the same location was 26.

The bias adjustment factor is $31/26 = 1.192$

If this adjustment factor is applied to the other monitoring stations in the district then the values obtained are still well below the air quality objective of $40\mu\text{g}/\text{m}^3$, the highest value would be 36.7

9.8 Narrow Congested Streets – it is recommended that local authorities specifically look at locations where congestion may create specific problems, and where the following criteria are met:

Streets are narrow (carriageway less than 10m)

Residential property is within 5m of the kerb

Average speed is less than 50kph (31 mph)

Traffic flow is greater than 10,000 vehicles per day

There is little chance of these conditions being met in Mid Suffolk, and no locations, which could be considered as “street canyons”

Data obtained from Suffolk County Council indicated that the only roads, which have traffic flows in excess of 10,000 vehicles per day are –

A14,

A140,

A1308 (Stowmarket Inner Relief Road),

A1120 (Cedars Link Road),

High Street, Needham Market and

B1115 Station Road, Stowmarket

These are considered below.

(a) The A14 carriageway is in excess of 10m

(b) The only section of the A1120 where traffic flows are in excess of 10,000 vehicles per day is the section between Stowmarket and the A14. There are no receptor locations along this stretch of road. Beyond Stowupland the traffic flows are much lower (figures for 2002 – 4057 vehicles per day)

(c) Average traffic speeds along the A140 are in excess of 50 kph (31 mph)

(d) The A1308 Inner Relief Road was considered, even though it is not felt that there are any properties within 5m of the kerb.

The DMRB screening model was used to run an assessment of 2005 levels of nitrogen dioxide. As all data was not available, this was run on a “worst case” scenario, of assuming distance from centre of road to receptor was 10m, average vehicle speed was 20kph (12 mph) and the proportion of heavy goods vehicles was 25%.

Even using this data, very much a worst-case scenario, the air quality objective of 40 $\mu\text{g}/\text{m}^3$ is not exceeded (a value of 39.2 was obtained) Therefore it can be confidently predicted that the objective will not be exceeded.

(e) The High Street in Needham Market also does not represent a “street canyon”, but the DMRB model was run using known vehicle counts, a known heavy duty vehicle count of 2.7% and assuming there was exposure at 5metres. The resultant value obtained was a predicted annual mean nitrogen dioxide concentration of 23.6 $\mu\text{g}/\text{m}^3$, well below the objective limit of 40, and close to the measured diffusion tube value of 24.

(f) Station Road West, Stowmarket, is the location, which most resembles a “street canyon”. Using the predicted traffic flow for 2006, and assuming exposure at 5m, a 5% heavy duty vehicle content and average traffic speeds down as low as 10 kph, the air quality objective is still not likely to be breached, the DMRB model predicts an annual mean nitrogen dioxide concentration of 30.3 $\mu\text{g}/\text{m}^3$.

9.9 Junctions – the combined effect of traffic flows at junctions may cause “hotspots” of nitrogen dioxide pollution, this is generally a matter to consider where there are more than 10,000 vehicles at a junction and a relevant exposure within 10 metres

As a means of evaluating this issue it was decided to look at those junctions, which are considered to be the busiest in the district (irrespective of exposure) and run the DMRB module to determine whether this was likely to be an issue.

The most likely location in Mid Suffolk is the junction of the A1308 with the B1115 (Station Road West) in Stowmarket, and there is exposure (Steeple View) at approximately 10m. The traffic flows were known for this location, and heavy-duty vehicles constitute 8.2% of the traffic. The DMRB model was then run, using a “worst case” scenario of an exposure at 10m and an average speed of just 20 kph (12mph). The result was an estimated nitrogen dioxide concentration of 35.1 $\mu\text{g}/\text{m}^3$ as an annual mean, which indicated there is no need to explore the issue further.

Other junctions, which were examined were the A140/B1077 junction, one of the busiest junctions on the A140. Traffic flows were known, it was assumed there would be an exposure at 10m, a “worst case” scenario of 25% heavy-duty vehicles and average speed of 100kph was used.

The result was an annual mean value of 33.1 $\mu\text{g}/\text{m}^3$.

A third busy junction, which was evaluated was the “Stonham Tap” junction of the A140/A1120. Once again, although the traffic flows were known, assumptions had to be made for the remaining data – 25% HDV, average speed 80 kph. Again, the result showed that there was no need to pursue this matter further, the estimated value being 35.3 $\mu\text{g}/\text{m}^3$.

Given that it is predicted that there will be no exceedences at the busiest junctions in the district it was not considered necessary to pursue this matter further.

9.10 Busy Streets – the intention here is to consider exposure of persons over a short period of time where they may be exposed to nitrogen dioxide emissions from vehicle exhausts.

The guidance recommends that consideration should be given to those locations, in “busy streets” where members of the public may regularly spend one hour or more in an outdoor location other than their normal domestic environment. e.g. streets with many shops, streets with outdoor bars and cafes.

Within Mid Suffolk there are very few locations where such exposure may occur, indeed the only likely location is Ipswich Street (The High Street) in Stowmarket.

The guidance advises that a “busy street” can be taken to mean one where there is an average daily traffic flow of over 10,000 vehicles. Reference to figures provided by Suffolk County Council shows that this is not the case with regard to Ipswich Street, Stowmarket.

The average number of vehicles per day in 2001 was 4842, and in 2002 it was 4804. Therefore, the number of vehicles is such that there is no need to consider a potential exceedence of the air quality objective for nitrogen dioxide at this location.

The other possible location where there may be exposure to persons in the street is the High street in Needham Market – the DMRB model has already been evaluated for this location, in **9.8** and the predicted levels are well below the objective levels

9.11 Roads With High Flow of Heavy Duty Vehicles – this is a factor to consider where the proportion of buses/heavy goods vehicles on a road is greater than 25%, this could include roads such as “bus only streets” and roads leading to industrial estates. If there is a relevant exposure within 10m, and if the number of heavy-duty vehicles exceeds 2500 then this source may require investigation

Consideration was given to the following sources -

Buses in Ipswich Street Stowmarket,

Heavy Goods Vehicles delivering to:

Needham Road Industrial Estate, Stowmarket

Eye Airfield Industrial Estate

TOMO Industrial Estate, Creeting Road Stowmarket

Lion Barn Industrial Estate, Needham Market

With respect to buses in Ipswich Street, Stowmarket observations undertaken indicated that the number of buses/other heavy goods vehicles was not remotely close to 25%

With regard to the Needham Road Industrial Estate, access will be off the A1120 Cedars Link road, or off the A1308, and there is no relevant exposure within 10m of the roads.

Access to the Eye Airfield estate is generally direct from the A140, and there is no relevant exposure.

Access to/from the TOMO industrial estate is mainly via Creting Road to the A14 carriageway, and there is no relevant exposure along this route. If vehicles were to access the site from the Stowmarket end of Creting Road then there may well be relevant exposure at properties along Creting Road, but observations confirm that the ratio of heavy goods vehicles is approximately 10% rather than the 25% which would give cause for concern.

Furthermore, traffic flow data from Suffolk County Council indicates that the average daily traffic flow for 2002 was 3505, so the number of heavy duty vehicles per day is approximately 350, and not remotely close to the 2500 at which more detailed assessment may be required.

No figures were available to indicate the percentage of heavy-duty vehicles accessing the Lion Barn Industrial Estate. However, once again, observations indicate that this is approximately 10% rather than 25%.

Therefore, there is no need to consider this source further. This is as expected, because there are no sites within Mid Suffolk which would be principally used by heavy duty vehicles, all will have a balanced traffic flow

9.12 New Roads— no new roads of any significance have been opened since the first round of air quality review and assessments. However, there is a proposal to construct the B1115 relief road in Stowmarket. This will run from the A1308 (Gipping Way), crossing over the London-Norwich railway line and Old Stowupland Road, and connecting to the B1115 Stowupland Road.

A full environmental appraisal has been undertaken, including an air quality assessment which concluded that air quality objectives would not be exceeded at any receptor location (8).

9.13 Roads Close To the Objective – during the previous assessment a monitoring exercise was undertaken close to the A14 carriageway in Claydon. This was considered to be the area where an exceedence of the objective was most likely. However, the mean value of $31 \mu\text{g}/\text{m}^3$ was well below the objective value of 40. Guidance recommends that where previous results were between 36 and 40 then a detailed assessment should be undertaken, but this is not the case in Mid Suffolk.

Diffusion tube data obtained from a location at Old Stowupland Road (10-15m from A14) indicated an annual mean exposure of 27.9.

Within Mid Suffolk all previous assessments have shown that receptors close to the A14 are the most likely locations at which exceedence of the nitrogen dioxide objective may occur.

9.14 Roads With Significantly Changed Traffic Flows – Guidance recommends that this issue should be considered where:

There are more than 10,000 vehicles per day

There is an increase of 25% or more in traffic flow

The road had previously been identified “at risk” of exceeding the objective

Figures obtained from Suffolk County Council indicated that there are few roads within the district where average daily traffic flows are in excess of 10,000 vehicles.

These are:

The A14 carriageway at all measured locations

The A1120 Cedar’s link road between Stowmarket and Stowupland

The A1308 Stowmarket Inner Relief Road

The A140 at all measured locations

Station Road, Stowmarket

High Street, Needham Market

However, none of these roads had previously been identified as being at risk of exceeding the air quality objective for nitrogen dioxide. As discussed in **9.13**, the A14 carriageway was considered the most likely exceedence, but testing had confirmed that this was not the case, nor was the estimated annual mean concentration within the band of 36-40 $\mu\text{g}/\text{m}^3$ at which re-consideration was advised.

Also, in respect of traffic flows, comparing values from 1998 (prior to first air quality review) with 2002, there had not been an increase of 25% along any of these roads.

(Note –historical data not available for High Street, Needham Market or Station Road, Stowmarket)

Annual Average Daily Traffic Flows (7 day) and Year on Year Percentage Change In Flow

<u>Road</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
	<u>AADT</u>	<u>AADT</u>	<u>AADT</u>	<u>AADT</u>	<u>AADT</u>

A1120	12078	12419	12760	12931	13053
		(+2.8%)	(+2.7%)	(+1.3%)	(+0.9%)
A1308	16521	15630	15678	15064	15071
		(-5.4%)	(+0.3%)	(-3.9%)	(+0.04%)
A140	11751	12532	12953	13554	14155
Mendlesham Airfield		(+6.6%)	(+3.3%)	(+4.6%)	(+4.4%)
A140	13499	13624	13873	14481	15090
Creeting St Mary		(+0.9%)	(+1.8%)	(+4.4%)	(+4.2%)
A140	13131	14121	14175	14228	14282
Thornham Parva		(+7.5%)	(+0.4%)	(+0.4%)	(+0.4%)

Therefore, there is no need to consider this issue further.

9.15 Bus Stations – there are no major bus stations within the district. Stowmarket is the largest town, but does not have the benefit of a bus station. There are smaller bus depots such as Galloways at Mendlesham and Simonds of Botesdale, but the number of bus movements is well below the 1000 per day at which guidance recommends this source should be considered

9.16 New Industrial Sources – with reference to Annex 2 of Appendix E to the guidance, there are no known new industrial sites with the potential to emit significant quantities of nitrogen dioxide

9.17 Industrial Sources With Increased Emissions – with reference to Appendix E of the guidance, the most significant sources of nitrogen dioxide emissions are combustion processes, the two most significant processes in Mid Suffolk are the Transco Gas Compressor Station and the Fibropower power station.

Reference to the public registers indicated that at Transco Compressor Station, Eye Airfield the annual emission of nitrogen dioxide for 2002 (29.7 tonnes) was considerably less than that in 2001 (47.8 tonnes).

With regard to Fibropower there had been no significant increase in nitrogen dioxide emissions (a significant increase is considered to be over 30%) over the past three years :-

2000 – 123.6 tonnes

2001 – 145.5 tonnes

2002 – 130.6 tonnes

There is no need therefore to consider these matters further

9.18 Aircraft – guidance recommends that aircraft should be considered as a potential source of nitrogen dioxide exposure where there is a relevant exposure within 500m of an airport boundary. There are no commercial airports within Mid Suffolk, and the only source warranting consideration is the Wattisham military airbase (partly in Mid Suffolk, partly within Babergh District Council).

The DEFRA “emissions helpdesk” were consulted to determine whether this source required further investigation. The response received was that the activities on site were not likely to be comparable to any commercial airport.

The Joint Helicopter Command were also forthcoming in providing details of aircraft movements over recent years, which were as follows:

1999 - 30,973

2000 – 35,758

2001 – 36, 506

2002 – 40,744

They also advised that due to current deployments the number of aircraft movements for 2003 would be lower (approximately 31,000) but anticipated that from 2004 onwards the number would return to approximately 40,000. These figures however are purely estimates.

Guidance recommends that consideration only need be given to exposure to emissions from airports where the annual throughput of passengers exceeds five million people or the annual throughput of freight exceeds five hundred thousand tonnes.

From the figures provided, and considering that the majority of aircraft movements are “two-man” helicopter flights with very little freight, it is clear that the airfield will not be remotely close to these parameters.

Therefore, there is no need to proceed to a more detailed assessment.

Conclusion

9.20 The screening of all potential sources, and reference to monitoring data shows that there are no locations within Mid Suffolk at which a detailed assessment of nitrogen dioxide is required.

10. Assessment of Particulate Matter (PM₁₀)

Previous Assessments

10.1 Stage 1 Review and Assessment March 1999 – it was concluded that due to the traffic flow on the A14, and the potential for particulate emissions from industrial and commercial processes, it was necessary to proceed to a second stage review.

10.2 Stage 2 Review and Assessment March 2000 – it was concluded that the air quality objective for particulate matter may be exceeded at locations along (adjacent to) the A14 carriageway, and that it was necessary to proceed to a third stage review.

10.3 Stage 3 Review and Assessment December 2001 – following continuous monitoring it was concluded that both the annual average and the 24hr objective would be met at all points along the A14.

Review and Assessment May 2003

10.4 The definition of PM₁₀ is “...*particulate matter which passes through a size-selective inlet with a 50% efficiency cut off at 10µm aerodynamic diameter*” Thus, in effect, it includes solid particles across a range of sizes, but generally less than 10µm in diameter.

10.5 Particles may be generated from combustion sources, such as road vehicles, power generation, industrial combustion etc. These particles are generally less than 2.5µm.

10.5 Particles generated from other sources, such as quarrying, construction and wind blown dusts and soils, are generally of larger particle size, but below 10µm

10.6 The air quality objectives for PM₁₀ are that the annual mean concentration should not exceed 40µg/m³ and that a 24-hour mean of 50µg/m³ should be exceeded on no more than 35 days per year. However, these standards are to become more stringent in the future, with an annual mean objective of 20µg/m³ to be met by the end of 2010.

10.7 Guidance on the upgrading and screening assessment recommends that consideration should be given to the following potential sources of particulate matter

(a) Monitoring data

(b) Junctions

(c) Roads with a high flow of buses and/or HGV's

- (d) New roads constructed or proposed since the first round of review and assessment
- (e) Roads close to the objective during the first round of review and assessment
- (f) Roads with significantly changed traffic flows
- (g) New industrial sources
- (h) Industrial sources with substantially increased emissions
- (i) Areas of domestic solid fuel burning
- (j) Quarries, landfill sites, open cast coal, handling of dusty cargo at ports
- (k) Aircraft

10.8 Monitoring data – the only monitoring data available is that from the national database of background concentrations, and that collected during the 3rd stage air quality review.

In respect of background concentrations, the predicted levels for 2004 and 2010 can be observed. The highest predicted values (in the Brome/Eye area) are 20.7 $\mu\text{g}/\text{m}^3$ for 2004, and 19.3 $\mu\text{g}/\text{m}^3$ for 2010. Whilst not necessarily having a significant effect on the current value of 50 $\mu\text{g}/\text{m}^3$, it is clear that the 2010 objective (an annual mean value of 20 $\mu\text{g}/\text{m}^3$) may be difficult to meet if background levels are already close to this objective.

In respect of monitoring data collated in May-July 2001, this was extrapolated to give a predicted annual value of 27.8 $\mu\text{g}/\text{m}^3$, well below the limit of 40.

The guidance advises on how to predict a future value based on this result

This requires evaluation of the degree of primary, secondary and gravimetric content of the PM_{10} fraction.

The outcome is a predicted 2004 annual mean value of 26.6 $\mu\text{g}/\text{m}^3$ and indicates that no further assessment is required.

However, this is not necessarily the case because whilst the annual mean objective may have been achieved, there is a second requirement relating to the number of “24-hour” exceedences per year, this is explored further in **10.12**.

10.9 Junctions – as discussed in **9.9** the approach taken was to identify those junctions where an exceedence of the air quality objective was most likely to occur

and to run the DMRB model on a “worst case” scenario to determine whether a detailed assessment was required.

The junction at which the air quality objective was most likely to be exceeded was the A1308/B1113 junction in the centre of Stowmarket.

Running this through the DMRB model, with known traffic flows, a known HDV content of 8.2%, an exposure at 10m and an estimated traffic speed of either 10 or 20 kph shows that there will be no exceedence of the objective.

Assuming 20 kph, the estimated annual mean is $26.5 \mu\text{g}/\text{m}^3$ and assuming 10kph it is 30.3, (with 29 exceedences of the 24-hour objective), these values are well below the air quality objective of 40.

The DMRB model was also run for the A140/A1120 junction, and the A140/B1077 junction the estimated annual means were 25.8 and 27.3 respectively.

Thus it can be concluded that there is no need to consider any junctions as warranting a detailed assessment.

10.10 Roads With a High Flow of Heavy Duty Vehicles – this is a factor to consider where the proportion of buses/heavy goods vehicles on a road is greater than 20%, this could include roads such as “bus only streets” and roads leading to quarries/freight terminals.

This matter was explored in **9.11**, and there are no relevant sites within Mid Suffolk.

10.11 New Roads – no new roads of any significance have been opened since the first round of air quality review and assessments. However, there is a proposal to construct the B1115 relief road in Stowmarket. This will run from the A1308 (Gipping Way), crossing over the London-Norwich railway line and Old Stowupland Road, and connecting to the B1115 Stowupland Road.

A full environmental appraisal has been undertaken, including an air quality assessment which concluded that air quality objectives would not be exceeded at any receptor location

10.12 Roads Close to The Objective – the previous monitoring exercise (May to July 2001) indicated that whilst the annual mean objective was likely to be met, the objective that a 24-hour mean value of $50 \mu\text{g}/\text{m}^3$ should be exceeded no more than 35 times was only just met. The 90.4th percentile was $50 \mu\text{g}/\text{m}^3$, which is the top limit of the objective.

Guidance recommends that where the 90th percentile is between 45 and 50 then it is necessary to proceed to a detailed assessment using the new emission factors.

There are five locations where proximity to the A14 could expose receptors to levels of PM₁₀ levels in excess of the objective,

Station Road, Claydon

The Crescent, Barham

Lower Crescent, Barham

Cooper's Way, Barham

Old Stowupland Road, Stowmarket

Although the guidance recommends that it is necessary to proceed to a detailed assessment because the previous assessment indicated the number of exceedences of the 24-hr objective may be breached, the DMRB module was used to assess predicted levels.

The module was run, using the predicted background concentrations from the local air quality website, traffic data for "Baylham", the closest site for which data was available, a 25% proportion of HDV's, an average speed of 120kph and a distance from source to receptor of 15m.

This was considered to be a generous assessment. The distance from centre of the source (i.e the central reservation of the A14) is probably in excess of 15m, the carriageway itself accounting for 7m.

The results obtained were that the estimated annual mean would be 30.8 µg/m³, well below the objective value of 40, and that the number of days on which the 24-hr objective of 50 µg/m³ would be exceeded was 31. This is below the objective value of 36.

Therefore, a detailed assessment of PM₁₀ in the A14 corridor adjacent to Barham and Claydon is not required at this time, but a more detailed assessment of PM₁₀, including some continuous monitoring is likely to be of value prior to the next upgrading and screening assessment at the end of April 2006.

10.13 Roads With Significantly Changed Traffic Flows – Guidance recommends that this issue should be considered where:

There are more than 10,000 vehicles per day

There is an increase of 25% or more in traffic flow, and

The road had previously been identified “at risk” of exceeding the objective.

Figures obtained from Suffolk County Council indicated that there are few roads within the district, which have average daily traffic flows in excess of 10,000 vehicles.

Those identified were -

The A14 carriageway at all measured locations

The A1120 Cedar’s link road between Stowmarket and Stowupland

The A1308 Stowmarket Inner Relief Road

The A140 at all measured locations

High Street, Needham market

Station Road, Stowmarket

Annual Average Daily Traffic Flows (7 day)

<u>Road</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
	<u>AADT</u>	<u>AADT</u>	<u>AADT</u>	<u>AADT</u>	<u>AADT</u>
A1120	12078	12419	12760	12931	13053
A1308	16521	15630	15678	15064	15071
A140	11751	12532	12953	13554	14155
Mendlesham Airfield					
A140	13499	13624	13873	14481	15090
Creeping St Mary					
A140	13131	14121	14175	14228	14282
Thornham Parva					

(Note – no historical data was available for High Street, Needham Market or Station Road, Stowmarket)

Traffic flows along the Stowmarket inner relief road have been very constant since 1998.

Between 1998 and 2002 there was only an 8.1% increase in traffic flow along the A1120 Cedar's link road.

At different locations along the A140 traffic flow (1998-2002) has increased by 8.8% (Thornham Parva) to up to 20.4% (Mendlesham), but at no location has it increased by up to 25%

The only one of these roads previously identified as being at risk of exceeding the air quality objective for PM₁₀ is the A14 carriageway. This has been explored in more detail in **10.12**.

10.14 New Industrial Sources – no new industrial processes with the potential to emit significant quantities of particulate matter have been developed since the previous air quality review

10.15 Industrial Sources With Increased Emissions – previous assessments (Stage 2 and Stage 3) have considered the Fibropower Power Station, Eye, as a potential source of significant PM₁₀ emissions, but concluded that the air quality objective would not be exceeded.

In this review, reference was made to the Public Register of emissions of authorised processes, and this indicated that there has been no increase in particulate emissions from this source.

The emissions are declared as total particulate matter (i.e. all particle sizes rather than specifically referring to PM₁₀) but this showed a generally downward trend in emissions, from 79.1 tonnes in 2000 to 72.1 tonnes in 2002.

There is no need therefore to consider this source further.

10.16 Areas of Domestic Solid Fuel Burning – the burning of solid fuel in the Mid Suffolk district is not considered to be significant (see **8.9**)

10.17 Quarries, Landfill Sites – fugitive emissions from quarries can cause high emissions of particulate matter, and there are several quarries within Mid Suffolk. However, the Environmental Control section has received few complaints regarding dust nuisance. Whilst the absence of complaints, in itself, cannot be used as a definitive means of stating that the objective will not be exceeded, it is a useful “measure” for evaluating a potential problem.

The only site that has been subject of a complaint since 1999 is the Needham Chalks quarry. Two complaints were received in 1999, and two, to date, in 2003. This site however is subject to regulation under the Environmental Protection Act, and

emissions from “point” sources are satisfactory. The closest properties are shielded by the quarry wall and should not be subjected to wind blown fugitive emissions.

It is not considered necessary to undertake further evaluation of this source

10.18 Aircraft – guidance recommends that aircraft should be considered as a potential source of exposure to PM₁₀ where there is a relevant exposure within 500m of an airport boundary. There are no commercial airports within Mid Suffolk, and the only source warranting consideration is the Wattisham military airbase (partly in Mid Suffolk, partly within Babergh District Council).

The DEFRA “emissions helpdesk” were consulted to determine whether this source required further investigation. The response received was that the activities on site were not likely to be comparable to any commercial airport.

The Joint Helicopter Command were also forthcoming in providing details of aircraft movements over recent years, which were as follows:

1999 - 30,973

2000 – 35,758

2001 – 36, 506

2002 – 40,744

They also advised that due to current deployments the number of aircraft movements for 2003 would be lower (approximately 31,000) but anticipated that from 2004 onwards the number would return to approximately 40,000. These figures however are purely estimates.

Guidance recommends that consideration only need be given to exposure to emissions from airports where the annual throughput of passengers exceeds five million people or the annual throughput of freight exceeds five hundred thousand tonnes.

From the figures provided, and considering that the majority of aircraft movements are “two-man” helicopter flights with very little freight, it is clear that the airfield will not be remotely close to these parameters.

Therefore, there is no need to proceed to a more detailed assessment.

Conclusion

10.19 After considering all potential sources of PM₁₀ emissions, it remains the case that the only source, which is likely to cause an exceedence of the objective, is traffic on the A14.

The previous assessment showed that compliance with the air quality objective for 24-hour exposure was only just achieved.

The DMRB model shows that exceedence of the objective is unlikely but as the prediction is close to the objective, a more detailed assessment, including some continuous monitoring, would provide useful confirmation prior to the next updating and screening assessment at the end of April 2006.

11. Conclusions and Recommendations

11.1 The latest review confirms that there is no likelihood of the air quality objectives being exceeded, in Mid Suffolk, for benzene, 1,3-butadiene, carbon monoxide, lead and sulphur dioxide.

11.2 The air quality objective for nitrogen dioxide is also unlikely to be breached at any location in the district. This was also the case during the previous assessment (December 2001), based on monitoring data.

11.3 It remains the case that the A14 carriageway is the main cause of concern in respect of air quality.

11.4 The main pollutant of concern in respect of air quality is particulate matter (PM₁₀). The upgrading and screening assessment has confirmed that air quality objectives will be met across most of the district, with the only possible exception being a few locations along the A14 corridor.

11.5 At these locations, the screening assessment, and the use of the DMRB software model suggests that the air quality objective for PM₁₀ will be met. However, previous assessment has been extremely close to the objective limit, therefore, a more detailed assessment of PM₁₀, including some continuous monitoring, should be undertaken prior to the next updating and screening assessment at the end of April 2006.

References

1. Great Britain, Dept of Environment (1995) : “*The Environment Act*” , The Stationary Office
2. Great Britain, Dept. of Environment, Transport and Regions (2000) : “*The Air Quality (England) Regulations*” , The Stationary Office
3. Great Britain, Dept of Environment, Food and Rural Affairs (2002) : “*The Air Quality (England) (Amendment) Regulations*” , The Stationary Office
4. Great Britain, Dept of Environment, Food and Rural Affairs (2003) : “*Local Air Quality Management, Policy Guidance LAQM.PG(03)*”, The Stationary Office
5. Great Britain, Dept of Environment, Food and Rural Affairs (2003) : “*Local Air Quality Management, Technical Guidance LAQM.TG(03)*”, The Stationary Office
6. The Highways Agency (1999) : “*Design Manual for Roads and Bridges, Environmental Assessment*”, The Stationary Office
7. Dept of Environment, Food and Rural Affairs (2003) : “*Local Air Quality Management*” , www.airquality.co.uk/archive/laqm/tools.php
8. Department of Environment Transport and the Regions (2000) : “*Review and Assessment Pollutant Specific Guidance*” LAQM.TG4(00)”, The Stationary Office
9. Mott MacDonald (2001) : “*Eye Power Air Quality Assessment Report*”, Mott MacDonald
10. Suffolk County Council (2002) : “*B1115 Relief Road, Stowmarket, Environmental Statement*”, LizLake Associates