

Report

Updating and Screening Assessment

Report to the Isle of Wight Council

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Executive Summary

The UK Government published its strategic policy framework for air quality management in 1995 establishing national strategies and policies on air quality which culminated in the Environment Act, 1995. The Air Quality Strategy¹ provides a framework for air quality control through air quality management and air quality standards. These and other air quality standards¹ and their objectives have been enacted through the Air Quality Regulations in 1997, 2000 and 2002. The Environment Act 1995 requires Local Authorities to undertake air quality reviews. In areas where an air quality objective is not anticipated to be met, Local Authorities are required to establish Air Quality Management Areas and implement action plans to improve air quality.

The first round of air quality review and assessments has been completed by the Isle of Wight Council. The Council is now required to proceed to the second round of review and assessment in which sources of emissions to air are reassessed to identify whether the situation has changed since the first round, and if so, what impact this may have on predicted exceedences of the air quality objectives.

The second round of review and assessment is to be undertaken in two steps. The first step is an Updating and Screening Assessment, which updates the Stage 1 and 2 review and assessment previously undertaken for all pollutants identified in the Air Quality Regulations. Where a significant risk of exceedence is identified for a pollutant it will be necessary for the local authority to proceed to a Detailed Assessment, equivalent to the previous Stage 3 assessments. Where a local authority does not need to undertake a Detailed Assessment, a progress report is required instead.

This report is an Updating and Screening Assessment for the Isle of Wight Council as outlined in the Government's published guidance.

The Isle of Wight Council has prepared Stage 1 and 2 Review and Assessment reports. The reports concluded that levels of all pollutants were likely to meet the objectives of the Strategy by the prescribed dates.

¹ Refers to standards recommended by the Expert Panel on Air Quality Standards. Recommended standards are set purely with regard to scientific and medical evidence on the effects of the particular pollutants on health, at levels at which risks to public health, including vulnerable groups, are very small or regarded as negligible.

The general approach taken to this Updating and Screening Assessment was to:

- Identify the conclusions of the last round of review and assessment for each of the seven pollutants included in the air quality regulations;
- Identify significant sources of emissions to air for the seven pollutants included in the air quality regulations, including major roads and industrial plant;
- Identify new sources not previously considered in the first round of review and assessment;
- Identify any sources for which emissions have changed significantly since the last round of review and assessment;
- Identify and interpret the significance of air quality monitoring data made available since the last round of review and assessment;
- Assess the risk of exceedences of the air quality objectives in locations where relative public exposure may exist using screening models and nomograms; and
- Where necessary, identify locations and pollutants for which further detailed assessment of air quality will be required.

This updating and screening assessment has concluded that:

Carbon monoxide

There are no roads on the Isle of Wight which can be classified as 'very busy' with receptors within 20m.

The Isle of Wight Council is not required to carry out a Detailed Assessment for carbon monoxide.

Benzene

There are no roads on the Isle of Wight which can be classified as 'very busy' with receptors within 20m. There are no petrol stations with a throughput greater than 2 million litres and with relevant exposure within 10m of the pumps. The only major fuel storage depot on the Isle of Wight is the BP Oils depot in East Cowes which has a throughput of 50 million litres of petrol per annum. There are relevant receptors within 40m of the depot. According to the nomograms in LAQM (TG(03)) there may be a risk of exceeding the 2010 annual mean objective of 5 µg/m³.

The Isle of Wight Council is required to carry out a Detailed Assessment for benzene.

1,3-Butadiene

Estimated background concentrations and data from national monitoring stations indicate that the objective for 1,3-butadiene is likely to be achieved by the end of 2003. There are no industrial processes, current or proposed, on the Isle of Wight which have the potential to emit 1,3-butadiene.

The Isle of Wight Council is not required to carry out a Detailed Assessment for 1,3-butadiene.

Lead

Emissions of lead from industrial processes on the Isle of Wight are not likely to exceed the objectives for lead to be achieved in 2004 and 2008.

The Isle of Wight Council is not required to carry out a Detailed Assessment for lead.

Nitrogen dioxide

The DMRB screening model indicates that the 2005 annual mean objective for NO₂ is unlikely to be exceeded at receptors near roads on the Isle of Wight.

The Isle of Wight Council is not required to carry out a Detailed Assessment for nitrogen dioxide.

Sulphur dioxide

There are no significant industrial or domestic sources of sulphur dioxide on the Isle of Wight.

There are more than 5,000 car ferry movements per year in each of the three main ports on the Isle of Wight.

The Isle of Wight Council is recommended to carry out a Detailed Assessment for sulphur dioxide based on car ferry emissions at the ports of Fishbourne, Cowes and Ryde.

PM₁₀

The DMRB screening model indicates that the annual mean objective of 40 µg/m³ for PM₁₀ will be met in 2004. The 24 hour mean objective of 50 µg/m³ is unlikely to be exceeded more than 35 times a year in 2004 at locations near roads on the Isle of Wight.

The Isle of Wight Council is not required to carry out a Detailed Assessment for PM₁₀.

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1 Screening Assessment

This section outlines the purpose of this Updating and Screening Assessment for the Isle of Wight Council, and the scope of the assessment.

1.1 PURPOSE OF THE UPDATING AND SCREENING ASSESSMENT

The first round of air quality review and assessments is now complete and all local authorities should have completed all necessary stages. Where the likelihood of exceedences of air quality objectives has been identified in areas of significant public exposure, an air quality management area should have been declared, followed by a further Stage 4 review and assessment, and the formulation of an action plan to eliminate exceedences. Local authorities are now required to proceed to the second round of review and assessment in which sources of emissions to air are reassessed to identify whether the situation has changed since the first round of review and assessment, and if so, what impact this may have on predicted exceedences of the air quality objectives. Such changes might include significant traffic growth on a major road, which had not been foreseen, construction of a new industrial plant with emissions to air, or significant changes in the emissions of an existing plant.

The second round of review and assessment is to be undertaken in two steps. The first step is an Updating and Screening Assessment, which updates the Stage 1 and 2 review and assessments previously undertaken for all pollutants identified in the Air Quality Regulations. Where a significant risk of exceedence is identified for a pollutant it will be necessary for the local authority to proceed to a Detailed Assessment, equivalent to the previous Stage 3 assessments. Where a local authority does not need to undertake a Detailed Assessment, a progress report is required instead.

1.2 OVERVIEW OF APPROACH TAKEN

The general approach taken to this Updating and Screening Assessment was to:

- Identify the conclusions of the last round of review and assessment for each of the seven pollutants included in the air quality regulations;
- Identify significant sources of emissions to air for the seven pollutants included in the air quality regulations, including major roads and industrial plant;
- Identify new sources not previously considered in the first round of review and assessment;
- Identify any sources for which emissions have changed significantly since the last round of review and assessment;
- Identify and interpret the significance of air quality monitoring data made available since the last round of review and assessment;
- Assess the risk of exceedences of the air quality objectives in locations where relative public exposure may exist using screening models and nomograms; and
- Where necessary, identify locations and pollutants for which further detailed assessment of air quality will be required.

1.3 RELEVANT defra DOCUMENTATION USED

This report takes into account the guidance in LAQM.TG(03)³, published January 2003.

1.4 POLLUTANTS CONSIDERED IN THIS REPORT

All pollutants included in the Air Quality Regulations² for the purposes of Review and Assessment (Table 1.1) have been considered in this report.

Table 1.1 Objectives included in the Air Quality Regulations 2000 and (Amendment) Regulations 2002 for the purpose of Local Air Quality Management			
Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene			
All authorities	16.25 µg/m ³	running annual mean	31.12.2003
Authorities in England and Wales only	5.00 µg/m ³	annual mean	31.12.2010
Authorities in Scotland and Northern Ireland only ^a	3.25 µg/m ³	running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	running annual mean	31.12.2003
Carbon monoxide			
Authorities in England, Wales and Northern Ireland only ^a	10.0 mg/m ³	maximum daily running 8-hour mean	31.12.2003
Authorities in Scotland only	10.0 mg/m ³	running 8-hour mean	31.12.2003
Lead	0.5 µg/m ³ 0.25 µg/m ³	annual mean annual mean	31.12.2004 31.12.2008
Nitrogen dioxide^b	200 µg/m ³ not to be exceeded more than 18 times a year 40 µg/m ³	1 hour mean annual mean	31.12.2005 31.12.2005
Particles (PM₁₀) (gravimetric)^c	50 µg/m ³ not to be exceeded more than 35 times a year 40 µg/m ³	24 hour mean annual mean	31.12.2004 31.12.2004
Authorities in Scotland only ^d	50 µg/m ³ not to be exceeded more than 7 times a year 18 µg/m ³	24 hour mean annual mean	31.12.2010 31.12.2010
Sulphur dioxide	350 µg/m ³ not to be exceeded more than 24 times a year 125 µg/m ³ not to be exceeded more than 3 times a year 266 µg/m ³ not to be exceeded more than 35 times a year	1 hour mean 24 hour mean 15 minute mean	31.12.2004 31.12.2004 31.12.2005

a. In Northern Ireland none of the objectives are currently in regulation. Air Quality (Northern Ireland) Regulations are scheduled for consultation early in 2003.

b. The objectives for nitrogen dioxide are provisional.

c. Measured using the European gravimetric transfer sampler or equivalent.

d. These 2010 Air Quality Objectives for PM₁₀ apply in Scotland only, as set out in the Air Quality (Scotland) Amendment Regulations 2002.

The new national particles objectives for England, Wales and Greater London are not currently included in Regulations for the purpose of LAQM. The Government and the Welsh Assembly Government however intends that the new particles objectives will be included in Regulations as soon as practicable after the review of the EU's first air quality daughter directive, which is due to be completed in 2004. The new particles objectives for England, Wales and Greater London are shown in Table 1.2. Whilst authorities have no obligation to review and assess against them, they may find it helpful to do so, in order to assist with longer-term planning, and the assessment of development proposals in their local areas. Assessment against these proposed objectives is provided in this report.

Table 1.2: Proposed new particles objectives for England, Wales and Greater London (not included in Regulations)			
Region	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
London	50 µg/m ³ not to be exceeded more than 10 times a year	24 hour mean	31.12.2010
London	23 µg/m ³	annual mean	31.12.2010
London	20 µg/m ³	annual mean	31.12.2015 ^a
Rest of England and Wales	50 µg/m ³ not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
Rest of England and Wales	20 µg/m ³	annual mean	31.12.2010

- a. This objective is provisional, to be achieved only where cost-effective and proportional local action can be identified

2 The UK Air Quality Strategy

The Government prepared the Air Quality Strategy for England, Scotland, Wales and Northern Ireland for consultation in August 1999. It was published in January 2000 (DETR, 2000)³.

2.1 NATIONAL AIR QUALITY STANDARDS

At the centre of the Air Quality Strategy is the use of national air quality standards to enable air quality to be measured and assessed. These also provide the means by which objectives and timescales for the achievement of objectives can be set. These standards and associated specific objectives to be achieved between 2003 and 2010 are shown in Table 1.1.

2.1.1 Timescales to achieve the objectives for the pollutants in Air Quality Strategy

In most local authorities in the UK, objectives will be met for most of the pollutants within the timescale of the objectives shown in Table 1.1. It is important to note that the objectives for NO₂ remain provisional. The Government has recognised the problems associated with achieving the standard for ozone and this will not therefore be a statutory requirement. Ozone is a secondary pollutant and transboundary in nature and it is recognised that local authorities themselves can exert little influence on concentrations when they are the result of regional primary emission patterns.

2.2 AIR QUALITY REVIEWS – THE APPROACHES AND EXPECTED OUTCOMES

Technical Guidance has been issued in 'Review and Assessment: Technical Guidance' LAQM.TG (03)³ to enable air quality to be monitored, modelled, reviewed and assessed in an appropriate and consistent fashion. This updating and screening assessment has considered the procedures set out in this technical guidance.

The primary objective of undertaking a review of air quality is to identify any areas that are unlikely to meet national air quality objectives and ensure that air quality is considered in local authority decision making processes. The complexity and detail required in a review depends on the risk of failing to achieve air quality objectives and it has been proposed therefore that reviews should be carried out in two steps. Both steps of review and assessment may be necessary and every authority is expected to undertake at least a first stage review and assessment of air quality in their authority area. The steps are briefly described in the following table, Table 2.1.

Table 2.1 Brief details of steps in the second Round of the Air Quality Review and Assessment process

Level of Assessment	Objective	Approach
Updating and Screening	To identify those matters that have changed since the last review and assessment, which might lead to a risk of an air quality objective being exceeded	Use a checklist to identify significant changes that require further consideration. Where such changes are identified, then apply simple screening tools to decide whether there is sufficient risk of an exceedance of an objective to justify a Detailed Assessment
Detailed Assessment	To provide an accurate assessment of the likelihood of an air quality objective being exceeded at locations with relevant exposure. This should be sufficiently detailed to allow the designation or amendment of any necessary AQMAs	Use quality-assured monitoring and validated modelling methods to determine current and future pollutant concentrations in areas where there is a significant risk of exceeding an air quality objective.
Annual Progress Reports	Local authorities should prepare annual air quality Progress Reports between subsequent rounds of reviews and assessments. The concept is that this will ensure continuity in the LAQM process.	The precise format for the Progress Report has not yet been determined, but will essentially follow the checklist approach that is set out in subsequent chapters of this document. Further details on the Progress Reports will be provided via the Helpdesks by the middle of 2003. It is envisaged that these Progress Reports could be useful for the compilation of annual 'state of the environment' reports that many authorities already prepare.

The deadline for completion of updating and screening assessments was May 2003, and for detailed assessments April 2004. For London Authorities who have declared an AQMA the deadline is the end of 2003.

2.3 LOCATIONS THAT THE REVIEW AND ASSESSMENT MUST CONCENTRATE ON

For the purpose of review and assessment, the authority should focus their work on locations where members of the public are likely to be exposed over the averaging period of the objective. Table 2.2 summarises the locations where the objectives should and should not apply.

Table 2.2 Typical locations where the objectives should and should not apply

Averaging Period	Pollutants	Objectives <i>should</i> apply at ...	Objectives <i>should not</i> generally apply at ...
Annual mean	<ul style="list-style-type: none"> • 1,3 Butadiene • Benzene • Lead • Nitrogen dioxide • Particulate Matter (PM₁₀) 	<ul style="list-style-type: none"> • All background locations where members of the public might be regularly exposed. 	<ul style="list-style-type: none"> • Building facades of offices or other places of work where members of the public do not have regular access.
		<ul style="list-style-type: none"> • Building facades of residential properties, schools, hospitals, libraries etc. 	<ul style="list-style-type: none"> • Gardens of residential properties.
			<ul style="list-style-type: none"> • Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term
24 hour mean and 8-hour mean	<ul style="list-style-type: none"> • Carbon monoxide • Particulate Matter (PM₁₀) • Sulphur dioxide 	<ul style="list-style-type: none"> • All locations where the annual mean objective would apply. 	<ul style="list-style-type: none"> • Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term.
		<ul style="list-style-type: none"> • Gardens of residential properties. 	

Table 2.2 (contd.) Typical locations where the objectives should and should not apply

Averaging Period	Pollutants	Objectives should apply at ...	Objectives should generally not apply at ...
1 hour mean	<ul style="list-style-type: none"> • Nitrogen dioxide • Sulphur dioxide 	<ul style="list-style-type: none"> • All locations where the annual mean and 24 and 8-hour mean objectives apply. 	<ul style="list-style-type: none"> • Kerbside sites where the public would not be expected to have regular access.
		<ul style="list-style-type: none"> • Kerbside sites (e.g. pavements of busy shopping streets). 	
		<ul style="list-style-type: none"> • Those parts of car parks and railway stations etc. which are not fully enclosed. 	
		<ul style="list-style-type: none"> • Any outdoor locations to which the public might reasonably be expected to have access. 	
15 minute mean	<ul style="list-style-type: none"> • Sulphur dioxide 	<ul style="list-style-type: none"> • All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer. 	

It is unnecessary to consider exceedences of the objectives at any location where public exposure over the relevant averaging period would be unrealistic. Locations should also represent non-occupational exposure.

3 Information used to support this assessment

This section lists the key information used in this review and assessment.

3.1 CONCLUSIONS FROM THE FIRST ROUND OF REVIEW AND ASSESSMENT OF AIR QUALITY FOR THE ISLE OF WIGHT COUNCIL

The Isle of Wight Council has completed the following review and assessments of air quality to date:

- Stage 1 April 2000
- Stage 2 June 2000

3.2 PROPOSED DEVELOPMENTS WHICH MAY AFFECT AIR QUALITY

3.2.1 Industry

No significant industrial developments have taken place or are planned on the Isle of Wight since the last Review.

3.2.2 Housing and Redevelopment

There are no current or proposed housing or other developments on the Isle of Wight which would impact on air quality.

3.2.3 Road

No new road developments have taken place or are planned for the Isle of Wight since the last Review.

3.3 MAPS AND DISTANCES OF RECEPTORS FROM ROADS

The Isle of Wight Council provided electronic OS LandLine™ maps which were used in the Geographical Information System (GIS) used in assessment. Individual buildings or groups of buildings (receptors) were identified from the electronic OS Landline maps of the areas. The distances of these receptors from the road, and the widths of the roads, were accurately determined from the maps.

The Ordnance Survey mapping included within this publication is provided by the Isle of Wight Council under licence from the Ordnance Survey in order to fulfill its public function to act as a planning authority. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. The Isle of Wight Licence No 076694.

3.4 ROAD TRAFFIC DATA

Road traffic data were collated from :

- data held in the National Atmospheric Emissions Inventory (NAEI, 2000)
- data supplied by the Isle of Wight Council

Where no average speed data were available, estimated speeds were used near receptors and junctions.

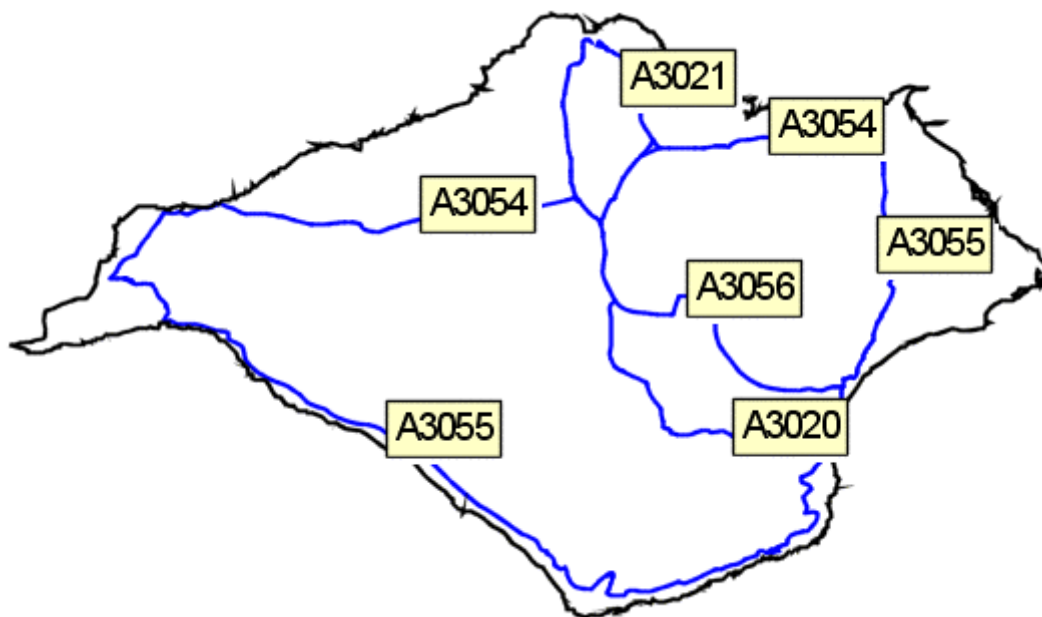


Figure 3.1 Major roads on the Isle of Wight

3.4.1 Fraction of HGVs

Percentages of Cars, LGVs, HGVs and buses were available from the count data for supplied in the NAEI 2000.

3.4.2 Base year for traffic

The base year for the traffic flows was 2000 (NAEI).

3.4.3 Traffic growth

Traffic growth figures were estimated using the TEMPRO database.

3.4.4 Distance from the centre of the road to the kerbside and to the receptors

Road widths and the distances of receptors from the road were taken from the electronic OS Landline™ of the Council area.

3.5 PART A AND B PROCESSES

According to data supplied in the Environment Agency Pollution Inventory and the Isle of Wight Council there are currently four Part A industrial processes (Appendix 2) and 53 Part B processes (listed in the Stage 1 Assessment report) on the Isle of Wight

3.6 AMBIENT MONITORING

The Isle of Wight Council undertakes monitoring of nitrogen dioxide using diffusion tubes at nine locations (Appendix A1).

4 Updating and Screening Assessment for Carbon Monoxide

4.1 THE NATIONAL PERSPECTIVE

The main source of carbon monoxide in the United Kingdom is road transport, which accounted for 67% of total releases in 2000. Annual emissions of carbon monoxide have been falling steadily since the 1970s, and are expected to continue to do so. Current projections indicate that road transport emissions will decline by a further 42% between 2000 and 2005. Existing policies will be sufficient to reduce maximum daily 8-hour mean concentrations of carbon monoxide below 10 mg/m^3 by about 2003.

4.2 STANDARD AND OBJECTIVE FOR CARBON MONOXIDE

The Government and the Devolved Administrations have adopted an 8-hour running mean concentration of 11.6 mg/m^3 as the air quality standard for carbon monoxide. The air quality objective has been set at a slightly tighter level of 10 mg/m^3 as a maximum daily running 8-hour mean concentration, to be achieved by the end of 2003, bringing it into line with the second Air Quality Daughter Directive limit value.

4.3 CONCLUSIONS OF THE FIRST ROUND OF REVIEW AND ASSESSMENT FOR CARBON MONOXIDE

The Stage 1 Review and Assessment concluded that the risk of exceeding the air quality objective may be considered negligible and no further action is required.

4.4 SCREENING ASSESSMENT OF CARBON MONOXIDE

The Technical Guidance LAQM TG(03) requires assessment of carbon monoxide to consider the following sources, data or locations:

- Monitoring Data
- Very Busy Roads

These are described in the following sections.

4.5 BACKGROUND CONCENTRATIONS FOR CARBON MONOXIDE

The average background carbon monoxide concentration estimated from the UK background maps⁶ was 0.20 mg/m^3 on the Isle of Wight with maximum concentration of 0.26 mg/m^3 .

4.6 SCREENING ASSESSMENT OF MONITORING DATA

Carbon monoxide is not monitored on the Isle of Wight. However, there were no exceedances of the 2003 CO objective anywhere in the UK in 2002.

4.7 SCREENING ASSESSMENT OF VERY BUSY ROADS

The guidance document LAQM TG(03)³ requires assessment of CO only at 'very busy roads'. Traffic flow data from the NAEI and traffic counts made by the Council indicate that there are no very busy roads on the Isle of Wight according to the classification given in LAQM TG (03).

4.8 CONCLUSIONS FOR CARBON MONOXIDE CONCENTRATIONS ON THE ISLE OF WIGHT

There are no very busy roads on the Isle of Wight. National monitoring data indicate that exceedances of the CO objective are unlikely anywhere in the UK.

The Isle of Wight Council is not required to carry out a Detailed Assessment for carbon monoxide.

5 Updating and Screening Assessment for Benzene

5.1 THE NATIONAL PERSPECTIVE

The main sources of benzene emissions in the UK are petrol-engined vehicles, petrol refining, storage and the distribution and uncontrolled emissions from petrol station forecourts without vapour recovery systems. A number of policy measures already in place, or planned for future years, will continue to reduce emissions of benzene. Since January 2000, EU legislation has reduced the maximum benzene content of petrol to 1%, from a previous upper limit of 5%. The European Auto-Oil programme will further reduce emissions for cars and light-duty vehicles, and emissions of benzene from the storage and distribution of petrol are controlled by vapour recovery systems. Forecasts based on national mapping suggest that the policy measures currently in place will achieve the 2003 objective at all urban background and roadside/kerbside locations. Whilst the 2010 objectives are expected to be met at all urban background, and most roadside locations, there is the possibility for some remaining exceedences which will require additional measures at a local level.

5.2 STANDARD AND OBJECTIVE FOR BENZENE

The Government and the Devolved Administrations have adopted a running annual mean concentration of $16.25 \mu\text{g}/\text{m}^3$ as the air quality standard for benzene, with an objective for the standard to be achieved by the end of 2003. However, in light of the health advice from EPAQS and the Department of Health's Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC) to reduce concentrations of benzene in air to as low a level as possible, additional tighter objectives have also been set. The additional objective is for an annual mean of $5 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2010 in England and Wales. In Scotland and Northern Ireland, a running annual mean of $3.25 \mu\text{g}/\text{m}^3$ has been adopted as an additional objective, to be achieved by the end of 2010.

5.3 CONCLUSIONS OF THE FIRST ROUND OF REVIEW AND ASSESSMENT FOR BENZENE

The First Stage Review and Assessment for the Isle of Wight concluded that there were no significant industrial or other sources of benzene in the Island and monitoring studies indicate that emissions from the Fawley petrol refinery in Southampton water will not significantly impact on the Island. The objective for benzene will not be exceeded on the Isle of Wight.

5.4 SCREENING ASSESSMENT OF BENZENE

The Technical Guidance LAQM TG(03)³ requires assessment of benzene to consider the following sources, data or locations:

- Monitoring Data

- Very Busy Roads or Junctions in Built-up Areas
- Industrial Sources
- Petrol Stations
- Major Fuel Storage Depots (Petroleum only)

These are described in the following sections.

5.5 BACKGROUND CONCENTRATIONS FOR BENZENE

The average background benzene concentration on the Isle of Wight, estimated from the UK background maps⁶ for 2001 was 0.2 $\mu\text{g}/\text{m}^3$, with maximum concentration of 0.4 $\mu\text{g}/\text{m}^3$.

5.6 SCREENING ASSESSMENT OF MONITORING DATA

Benzene is not monitored on the Isle of Wight.

There is a roadside monitoring station at London Marylebone Road which is indicative of the concentrations experienced at busy roadside locations. The concentrations measured at this station have decreased consistently since 1998 and current annual means are below the 2010 running annual mean objective value for England and Wales of 5 $\mu\text{g}/\text{m}^3$ (Table 5.1).

Table 5.1 Benzene measurements made at London Marylebone Rd

Year	Benzene $\mu\text{g}/\text{m}^3$
1998	12.8
1999	10.8
2000	6.3
2001	4.5
2002	3.5

5.7 SCREENING ASSESSMENT OF VERY BUSY ROADS

The guidance document LAQM TG(03)³ requires assessment of benzene only at 'very busy roads'. Traffic flow data from the NAEI and traffic counts made by the Council indicate that there are no very busy roads on the Isle of Wight according to the classification given in LAQM TG (03).

5.8 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

According to information from the Environment Agency Pollution Inventory and the Council, none of the Authorised processes on the Isle of Wight emit significant amounts benzene.

There are no new industrial sources or existing industrial sources with significantly increased emissions since the last review.

5.9 SCREENING ASSESSMENT OF PETROL STATIONS

There are no petrol stations on the Isle of Wight which have a throughput of more than 2 million litres per annum and are in the vicinity of a busy road.

5.10 SCREENING ASSESSMENT OF FUEL STORAGE DEPOTS

The only major fuel storage depot on the Isle of Wight is the BP Oils depot in East Cowes which has a throughput of 50 million litres of petrol per annum. This facility was considered in the Stage 1 Review and Assessment and any emissions not considered to have a significant impact on local air quality. The National Atmospheric Emissions Inventory provides an estimated an emission of 31Kg of benzene per annum from the depot . Using the nomograms in LAQM TG(03) if there are any relevant receptors at a distance of up to 20m from the depot, assuming a ground level emission, then a detailed assessment is required . In 2010 if there are any relevant receptors at a distance of up to 50m, assuming a ground level emission, then a detailed assessment is required. There is a new housing development, at East Cowes Marina, immediately to the north of the Fuel Depot,with dwellings within 40 m of the depot . There are relevant receptors within 40m of the depot A detailed assessment of benzene against the 2010 objective is therefore required.

5.11 CONCLUSIONS FOR BENZENE CONCENTRATIONS ON THE ISLE OF WIGHT

There are no roads on the Isle of Wight which can be classified as 'very busy' with receptors within 20m. There are no petrol stations with a throughput greater than 2 million litres and with relevant exposure within 10m of the pumps.

The only major fuel storage depot on the Isle of Wight is the BP Oils depot in East Cowes which has a throughput of 50 million litres of petrol per annum. There are relevant receptors within 40m of the depot.

The Isle of Wight Council is required to carry out a Detailed Assessment for benzene.

6 Updating and Screening Assessment for 1,3-Butadiene

6.1 THE NATIONAL PERSPECTIVE

The main source of 1,3-butadiene in the United Kingdom is emissions from motor vehicle exhausts. 1,3-butadiene is also an important industrial chemical and is handled in bulk at a small number of industrial premises. Maximum running annual mean concentrations of 1,3-butadiene measured at all urban background/centre and roadside locations in the national network are already well below the 2003 objective of $2.25 \mu\text{g}/\text{m}^3$. The increasing numbers of vehicles equipped with three way catalysts will significantly reduce emissions of 1,3-butadiene in future years. Recently agreed further reductions in vehicle emissions and improvements to fuel quality are expected to further reduce emissions of 1,3-butadiene from vehicle exhausts. These measures are expected to deliver the air quality objective by the end of 2003.

6.2 STANDARD AND OBJECTIVE FOR 1,3-BUTADIENE

The Government and the Devolved Administrations have adopted a maximum running annual mean concentration of $2.25 \mu\text{g}/\text{m}^3$ as an air quality standard for 1,3-butadiene. The objective is for the standard to be achieved by the end of 2003.

6.3 CONCLUSIONS OF THE FIRST ROUND OF REVIEW AND ASSESSMENT FOR 1,3-BUTADIENE

The First Stage Review and Assessment for the Isle of Wight concluded that there were no significant industrial or other sources of 1,3-butadiene in the Island or surrounding locations and that the objective for the objective for 1,3-butadiene will not be exceeded on the Isle of Wight.

6.4 SCREENING ASSESSMENT OF 1,3-BUTADIENE

The Technical Guidance LAQM TG(03) requires assessment of 1,3-butadiene to consider the following sources, data or locations:

- Monitoring Data
- New Industrial Sources
- Existing Industrial Sources with Significantly Increased Emissions

These are described in the following sections.

6.5 BACKGROUND CONCENTRATIONS FOR 1,3-BUTADIENE

The average background 1,3-butadiene concentration in 2001 estimated from the UK background maps⁶ was $0.08 \mu\text{g}/\text{m}^3$ on the Isle of Wight with maximum concentration of $0.14 \mu\text{g}/\text{m}^3$.

6.6 SCREENING ASSESSMENT OF MONITORING DATA

No monitoring of 1,3-butadiene has been undertaken on the Isle of Wight. There is a roadside monitoring station at London Marylebone Road which is indicative of the concentrations experienced at busy roadside locations. The concentrations measured at this station have decreased consistently since 1998 and current annual means are below the 2003 running annual mean objective value for England and Wales of 2.25 $\mu\text{g}/\text{m}^3$ (Table 6.1).

Table 6.1 1,3-butadiene measurements made at London Marylebone Rd

Year	1,3-bd $\mu\text{g}/\text{m}^3$
1998	2.4
1999	1.9
2000	1.6
2001	1.1
2002	0.9

6.7 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

According to information from the Environment Agency Pollution Inventory and the Council, none of the Authorised processes on the Isle of Wight emit 1,3-butadiene.

There are no new industrial sources or existing industrial sources with significantly increased emissions since the last review.

6.8 CONCLUSIONS FOR 1,3-BUTADIENE CONCENTRATIONS ON THE ISLE OF WIGHT

Estimated background concentrations and data from national monitoring stations indicate that the objective for 1,3-butadiene is likely to be achieved by the end of 2003. There are no industrial processes, current or proposed, on the Isle of Wight which have the potential to emit 1,3-butadiene.

The Isle of Wight Council is not required to carry out a Detailed Assessment for 1,3-butadiene.

7 Updating and Screening Assessment for Lead

7.1 THE NATIONAL PERSPECTIVE

The agreement reached between the European Parliament and the Environment Council on the Directive on the Quality of Petrol and Diesel Fuels (part of the Auto-Oil Programme) has led to the ban on sales of leaded petrol in the United Kingdom with effect from 1 January 2000. Emissions of lead are now restricted to a variety of industrial activities, such as battery manufacture, pigments in paints and glazes, alloys, radiation shielding, tank lining and piping.

Detailed assessments of the potential impact of lead emissions from industrial processes have been undertaken by the Government and the Devolved Administrations, based upon both monitoring and sector analysis studies. The former has included a 12-month monitoring survey in the vicinity of 30 key industrial sites in the UK, which has been used to supplement information already provided from the non-automatic monitoring networks. These monitoring data have generally indicated no exceedances of the 2004 or 2008 objectives, although locations in proximity to non-ferrous metal production and foundry processes were deemed to be at risk.

7.2 STANDARD AND OBJECTIVE FOR LEAD

The Government and the Devolved Administrations have adopted an annual mean concentration of $0.5 \mu\text{g}/\text{m}^3$ as the air quality standard for lead, with an objective for the standard to be achieved by the end of 2004. In addition, a lower air quality objective of $0.25 \mu\text{g}/\text{m}^3$ to be achieved by the end of 2008 has also been set.

7.3 CONCLUSIONS OF THE FIRST ROUND OF REVIEW AND ASSESSMENT FOR LEAD

The Stage 1 Review and Assessment for the Isle of Wight concluded that there were no significant industrial or other sources of lead in the Island or surrounding locations, and that the objective for the objective for lead will not be exceeded on the Isle of Wight.

7.4 SCREENING ASSESSMENT OF LEAD

The Technical Guidance LAQM TG(03) requires assessment of lead to consider the following sources, data or locations:

- Monitoring Data outside an AQMA
- New Industrial Sources
- Existing Industrial Sources with Significantly Increased Emissions

These are described in the following sections.

7.5 SCREENING ASSESSMENT OF MONITORING DATA

No monitoring of lead has been undertaken on the Isle of Wight.

7.6 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

According to information from the Environment Agency Pollution Inventory and the Council, none of the Authorised processes on the Isle of Wight emit lead.

There are no new industrial sources or existing industrial sources with significantly increased emissions since the last review.

7.7 CONCLUSIONS FOR LEAD CONCENTRATIONS IN THE ISLE OF WIGHT

Emissions of lead from industrial processes on the Isle of Wight are not likely to exceed the objectives for lead to be achieved in 2004 and 2008.

The Isle of Wight Council is not required to carry out a Detailed Assessment for lead.

8 Updating and Screening Assessment for Nitrogen Dioxide

8.1 THE NATIONAL PERSPECTIVE

The principal source of NO_x emissions is road transport, which accounted for about 49% of total UK emissions in 2000. Major roads carrying large volumes of high-speed traffic (such as motorways and other primary routes) are a predominant source, as are conurbations and city centres with congested traffic. Within most urban areas, the contribution of road transport to local emissions will be much greater than for the national picture.

Meeting the annual mean objective in 2005, and the limit value in 2010, is expected to be considerably more demanding than achieving the 1-hour objective. National studies have indicated that the annual mean objective is likely to be achieved at all urban background locations outside of London by 2005, but that the objective may be exceeded more widely at roadside sites throughout the UK in close proximity to busy road links. Projections for 2010 indicate that the EU limit value may still be exceeded at urban background sites in London, and at roadside locations in other cities.

8.2 STANDARDS AND OBJECTIVES FOR NITROGEN DIOXIDE

The Government and the Devolved Administrations have adopted two Air Quality Objectives for nitrogen dioxide, as an annual mean concentration of 40 µg/m³, and a 1-hour mean concentration of 200 µg/m³ not to be exceeded more than 18 times per year. The objectives are to be achieved by the end of 2005.

8.3 CONCLUSIONS OF THE FIRST ROUND OF REVIEW AND ASSESSMENT FOR NITROGEN DIOXIDE

The Stage 2 Review and Assessment report concluded that the annual average and hourly NO₂ objectives will not be exceeded at relevant locations on the Isle of Wight and a more detailed review is not required.

8.4 SCREENING ASSESSMENT OF NITROGEN DIOXIDE

The Technical Guidance LAQM TG(03)³ requires assessment of nitrogen dioxide to consider the following sources, data or locations:

- Monitoring data outside an AQMA
- Monitoring data within an AQMA
- Narrow congested streets with residential properties close to the kerb
- Junctions
- Busy streets where people may spend 1-hour or more close to traffic
- Roads with high flow of buses and/or HGVs
- New roads constructed or proposed since first round of review and assessment
- Roads close to the objective during the first round of review and assessment

- Roads with significantly changed traffic flows
- Bus Stations
- New industrial sources
- Industrial sources with substantially increased emissions
- Aircraft

These are evaluated in the following sections.

8.5 BACKGROUND CONCENTRATIONS FOR NITROGEN DIOXIDE

The estimated average background nitrogen dioxide concentration for 2001 was 13 $\mu\text{g}/\text{m}^3$ on the Isle of Wight with a maximum concentration of 19 $\mu\text{g}/\text{m}^3$.

8.6 SCREENING ASSESSMENT OF MONITORING DATA

8.6.1 Monitoring data within/outside AQMAs

The Isle of Wight has not declared any AQMAs.

8.6.2 Diffusion tube monitoring

The Isle of Wight Council carries out monitoring of NO_2 by diffusion tubes at 9 locations on the Isle of Wight (Table 8.1, Figure 8.1). The tubes are supplied by Stanger Science and analysed by GradKo Ltd.

Table 8.1 NO_2 Diffusion Tube Locations

No	Name	Type*	East	North
IW4	Sandown High School	B	458600	84600
IW5	Ryde High School	B	458300	91800
IW1	Carisbrooke Castle	B	448400	88800
IW2	Cowes High School	B	449100	94800
IW3	Medina High School	K	450800	90400
IW6	Newport Road Cowes	K	449200	91500
IW7	Fairlee Road Newport	K	450400	98500
IW8	Blackwater Service Station	K	450700	86500
IW9	lake Hill Sandown	K	459200	83700

*B=Background
K=Kerbside

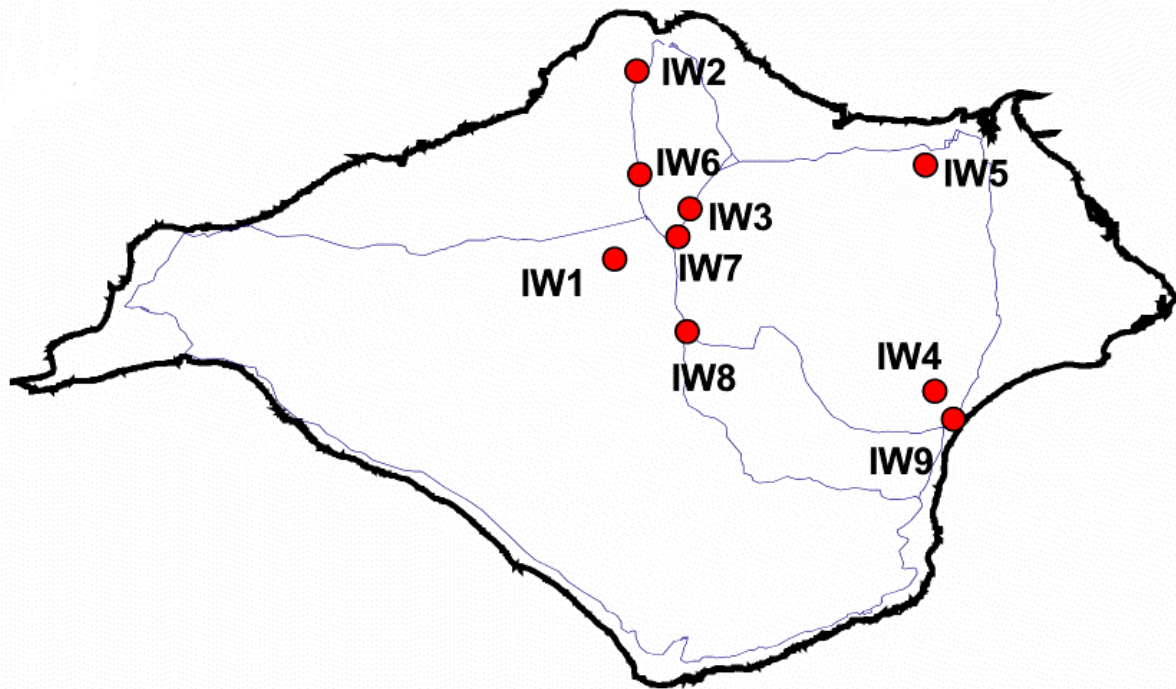


Figure 8.1 Diffusion Tube monitoring sites on the Isle of Wight

8.6.3 Bias correction of diffusion tube data

There are no intercomparison data available to estimate a bias correction factor for the diffusion tube results. The tubes are analysed by GradKo, and the result of the national NO₂ intercomparison exercise December 2002 – April 2003 indicate that Gradko overestimate concentrations by up to 20%. The bias adjustment factors provided on the Review and Assessment web site indicate that a 1.28 may be applicable. To provide a conservative estimate of NO₂ of concentrations the NO₂ annual mean have been multiplied by 1.28

8.6.4 Future Year Estimates

From Guidance LAQM TG(03)³ the adjustment factors to estimate annual average concentrations in 2005 from 2002 are 0.92 at roadside sites and 0.93 background sites.

**Table 8.2 Annual Mean Nitrogen Dioxide Concentrations Isle of Wight Sites $\mu\text{g}/\text{m}^3$
Bias corrected**

Site	Type	NO ₂ 2002	NO ₂ 2005
IW1	B	11	11
IW2	B	13	12
IW3	K	24	22
IW4	B	36	34
IW5	B	17	16
IW6	K	15	14
IW7	K	10	9
IW8	K	37	34
IW9	K	16	15

K=Roadside

B=Background

Annual average concentrations measured at on the Isle of Wight in 2002 were below the 40 $\mu\text{g}/\text{m}^3$ annual average objective value and predicted to still be below 40 $\mu\text{g}/\text{m}^3$ by 2005.

8.6.5 Automatic Monitoring

No automatic monitoring of NO₂ has been undertaken on the Isle of Wight.

8.7 SCREENING ASSESSMENT OF ROAD TRAFFIC SOURCES

NO₂ concentrations from road traffic for 2005 were estimated using the DMRB model (Table 8.3). Traffic flow data were taken from the NAEI 2000. A traffic growth factor of 1.11 to 2005 was used, calculated from the TEMPRO database.

Table 8.3 Estimated NO₂ concentrations near A roads on the Isle of Wight (NAEI Data)

Road	East	North	Distance to Road centre m	AADT 2005	Speed km/h	% HDV	NO ₂ 2005 $\mu\text{g}/\text{m}^3$
A3020	450000	89500	5	27197	60	4.4	24.8
A3020	455000	81700	5	7445	60	4.2	20.2
A3020	449600	95000	5	5938	60	3.2	19.2
A3020	450600	86900	5	19436	60	5.6	24.6
A3020	450300	89000	5	14817	60	4.7	23.4
A3021	451060	95000	5	8660	60	4.5	20.8
A3021	452000	92461	5	13502	60	4.9	23.0
A3021	450400	95590	5	2180	60	4.0	17.8
A3021	450200	95550	5	8720	60	4.0	20.6
A3021	450250	95640	5	6540	60	4.0	19.7
A3021	451919	91906	5	3285	60	4.9	18.4

Road	East	North	Distance to Road centre m	AADT 2005	Speed km/h	% HDV	NO ₂ 2005 µg/m ³
A3054	440000	89160	5	6210	60	5.5	20.0
A3054	459201	92640	5	7650	60	4.6	20.4
A3054	433400	88000	5	2957	60	6.1	18.5
A3054	452000	91724	5	19653	60	2.9	22.9
A3054	455000	92060	5	18468	60	4.6	23.9
A3054	456000	92330	5	17638	60	4.2	23.5
A3054	458930	92540	5	7147	60	3.7	19.9
A3054	459100	92520	5	7147	60	3.7	19.9
A3054	452239	92036	5	11002	60	6.5	22.7
A3054	450800	90400	5	19664	60	4.3	23.8
A3055	450000	76250	5	1913	60	3.5	17.6
A3055	458500	82000	5	7498	60	4.0	20.1
A3055	459950	92710	5	7853	60	3.4	20.1
A3055	459260	92580	5	6936	60	5.4	20.3
A3055	456400	77600	5	1635	60	3.9	17.5
A3055	456400	77510	5	1635	60	3.9	17.5
A3055	457470	80000	5	2180	60	4.8	17.9
A3056	455000	84240	5	14190	60	4.8	23.3
A3201	450350	95550	5	6540	60	4.0	19.7

This DMRB screening model run indicates that the 2005 annual mean objective for NO₂ is unlikely to be exceeded at receptors close to A roads on the Isle of Wight.

A further DMRB model run was undertaken using local traffic data and receptor distances calculated from the OS Landline maps (Table 8.4).

Table 8.3 Estimated NO₂ concentrations near A roads on the Isle of Wight (IoW Data)

Town	Road	Distance to Road centre m	AADT 2005	Speed km/h	% HDV	NO ₂ 2005 µg/m ³
Ryde	St Johns Hill	14	13837	48	6	15.8
Newport	Fairlee Road	12.8	13560	48	6	15.9
Newport	Fairlee Road	12.8	25234	48	6	17.7
Newport	Horsebridge Hill	10.5	29771	48	6	18.7
Newport	Forest Road	12	14188	48	6	16.2
Sandown	Broadway	6	14965	48	6	17.4
East Cowes	Whippingham Road	6.6	19987	48	6	18.2
Newport	Medina Way	25	37494	48	6	16.6
Shanklin	Sandown Road	10.7	23968	48	6	18.0
Lake	Newport Road	9.6	17667	48	6	17.4
Newport	Forest Road	12	15844	48	6	10.4
Wootton	High Street	11	22247	48	6	17.7
Lake	Lake Hill	9.8	26343	48	6	18.4

This DMRB screening model run also indicates that the 2005 annual mean objective for NO₂ is unlikely to be exceeded at receptors close to A roads on the Isle of Wight.

8.7.1 Narrow congested streets with residential properties close to the kerb

There are no roads on the Isle of Wight meeting this description.

8.7.2 Busy Junctions

There are no junctions on the Isle of Wight with flows of more than 10000 vehicles per day and relevant receptors within 10m.

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

There are no roads on the Isle of Wight meeting this description.

8.7.4 New roads constructed or proposed since first round of review and assessment

There are no new roads on the Isle of Wight proposed or constructed since the last Review and Assessment.

8.7.5 Roads with significantly changed traffic flows

There are no roads on the Isle of Wight with significantly increased traffic flows since the last Review and Assessment.

8.8 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

There are no new industrial sources or existing industrial sources with significantly increased emissions since the last review.

8.9 SCREENING ASSESSMENT OF OTHER TRANSPORT SOURCES**8.9.1 Bus Stations**

There are no bus stations on the Isle of Wight with more than 1000 buses per day.

8.9.2 Airports

There are no airports with a throughput of 5 million passengers per year in or near the Isle of Wight.

8.10 CONCLUSIONS FOR NITROGEN DIOXIDE CONCENTRATIONS ON THE ISLE OF WIGHT

The DMRB screening model indicates that the 2005 annual mean objective for NO₂ is unlikely be exceeded at receptors near roads on the Isle of Wight.

The Isle of Wight Council is not required to carry out a Detailed Assessment for nitrogen dioxide.

9 Updating and Screening Assessment for Sulphur Dioxide

9.1 THE NATIONAL PERSPECTIVE

The main source of sulphur dioxide in the United Kingdom is power stations, which accounted for more than 71% of emissions in 2000. There are also significant emissions from other industrial combustion sources. Domestic sources now only account for 4% of emissions, but can be locally much more significant. Road transport currently accounts for less than 1% of emissions.

Local exceedences of the objectives (principally the 15-minute mean objective) may occur in the vicinity of small combustion plant (less than 20 MW) which burn coal or oil, in areas where solid fuels are the predominant form of domestic heating, and in the vicinity of major ports.

9.2 STANDARD AND OBJECTIVE FOR SULPHUR DIOXIDE

The Government and the Devolved Administrations have adopted a 15-minute mean of $266 \mu\text{g}/\text{m}^3$ as an air quality standard for sulphur dioxide, with an objective for the standard not to be exceeded more than 35 times in a year by the end of 2005.

Additional objectives have also been set which are equivalent to the EU limit values specified in the First Air Quality Daughter Directive. These are for a 1-hour mean objective of $350 \mu\text{g}/\text{m}^3$, to be exceeded no more than 24 times per year, and a 24-hour objective of $125 \mu\text{g}/\text{m}^3$, to be exceeded no more than 3 times per year, to be achieved by the end of 2004.

9.3 CONCLUSIONS OF THE FIRST ROUND OF REVIEW AND ASSESSMENT FOR SULPHUR DIOXIDE

The Stage 2 Review and Assessment report concluded that the annual average and hourly SO_2 objectives will not be exceeded at relevant locations on the Isle of Wight and a more detailed review is not required.

9.4 SCREENING ASSESSMENT OF SULPHUR DIOXIDE

The Technical Guidance LAQM TG(03) requires assessment of sulphur dioxide to consider the following sources, data or locations:

- Monitoring data within an AQMA
- New industrial sources
- Industrial sources with substantially increased emissions
- Areas of domestic coal burning
- Small boilers (>5MW (thermal)) burning coal or oil
- Shipping
- Railway Locomotives

These are evaluated in the following sections.

9.5 BACKGROUND CONCENTRATIONS FOR SULPHUR DIOXIDE

The estimated average background sulphur dioxide concentration for 2001 was $2.6 \mu\text{g}/\text{m}^3$ with maximum concentration of $7.9 \mu\text{g}/\text{m}^3$.

9.6 SCREENING ASSESSMENT OF MONITORING DATA

Sulphur Dioxide is not monitored on the Isle of Wight.

9.7 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

Two of the Part A processes emit SO_2 . Both of these were examined in detail in the Stage 2 report and there have been no changes to these processes since then.

There are no new industrial sources or existing industrial sources with significantly increased emissions since the last review.

9.7.1 Small Boilers

There are no small boiler ($>5 \text{ MW}_{\text{thermal}}$) plants on the Isle of Wight

9.8 DOMESTIC COAL BURNING

According to information supplied by the Isle of Wight Council there are no areas of the Isle of Wight where there are significant areas of domestic coal burning as a source of sulphur dioxide.

9.9 SCREENING ASSESSMENT OF OTHER TRANSPORT SOURCES

9.9.1 Railways

According to information supplied by the Isle of Wight Council there are no areas where railway engines are run for more than 15 minutes continuously and where members of the public might be exposed.

9.9.2 Shipping

There are three car ferry terminals on the Isle of Wight with significant numbers (>5000) of shipping movements per year (Table 9.1).

Table 9.1 Isle of Wight Shipping Movements 2003

Port	Shipping Line	Ship movements per year
Fishbourne	Wightlink	25,300
Yarmouth	Wightlink	15,000
Cowes	Red Funnel	23,400

There are relevant receptors within 1km of these ports. Based on the guidance given in LAQM TG(03) and advice from the operator of the Pollutant Specific Helpdesk, the shipping emission could lead to exceedences of the 15 minute objective and therefore a Detailed Assessment should be undertaken to quantify the impact on ship emission on local receptors.

Shipping emissions were not addressed in the Stage 2 Review and Assessment.

9.10 CONCLUSIONS FOR SULPHUR DIOXIDE CONCENTRATIONS ON THE ISLE OF WIGHT

There are no significant industrial or domestic sources of sulphur dioxide on the Isle of Wight.

There are a more than 5,000 car ferry movements per year in the three main ports on the Isle of Wight. The Isle of Wight Council is required to carry out a Detailed Assessment for sulphur dioxide based on car ferry emissions at the ports of Fishbourne, Cowes and Yarmouth.

10 Updating and Screening Assessment for PM₁₀

10.1 THE NATIONAL PERSPECTIVE

National UK emissions of primary PM₁₀ have been estimated as totalling 184,000 tonnes in 1997. Of this total, around 25% was derived from road transport sources. It should be noted that, in general, the emissions estimates for PM₁₀ are less accurate than those for the other pollutants with prescribed objectives, especially for sources other than road transport.

The Government established the Airborne Particles Expert Group (APEG) to advise on sources of PM₁₀ in the UK and current and future ambient concentrations. Their conclusions were published in January 1999 (APEG, 1999). APEG concluded that a significant proportion of the current annual average PM₁₀ is due to the secondary formation of particulate sulphates and nitrates, resulting from the oxidation of sulphur and nitrogen oxides. These are regional scale pollutants and the annual concentrations do not vary greatly over a scale of tens of kilometres. There are also natural or semi-natural sources such as wind-blown dust and sea salt particles. The impact of local urban sources is superimposed on this regional background. Such local sources are generally responsible for winter episodes of hourly mean concentrations of PM₁₀ above 100 µg/m³ associated with poor dispersion. However, it is clear that many of the sources of PM₁₀ are outside the control of individual local authorities and the estimation of future concentrations of PM₁₀ are in part dependent on predictions of the secondary particle component.

10.2 STANDARD AND OBJECTIVE FOR PM₁₀

The Government and the Devolved Administrations have adopted two Air Quality Objectives for fine particles (PM₁₀), which are equivalent to the EU Stage 1 limit values in the first Air Quality Daughter Directive. The objectives are 40 µg/m³ as the annual mean, and 50 µg/m³ as the fixed 24-hour mean to be exceeded on no more than 35 days per year, to be achieved by the end of 2004. In addition there are objectives of 50 µg/m³ as the fixed 24-hour mean to be exceeded on no more than 7 days per year, and 18 µg/m³ as the annual mean to be achieved by the end of 2010 which applies to Scottish Authorities only. There are provisional PM₁₀ objectives for England, Wales and Northern Ireland to be achieved by 2010. The Objective for England (outside London) Wales and Northern Ireland is 50 µg/m³ as the fixed 24-hour mean to be exceeded on no more than 7 days per year, and 20 µg/m³ as the annual mean. The objectives are based upon measurements carried out using the European gravimetric transfer reference sampler or equivalent.

10.3 CONCLUSIONS OF THE FIRST ROUND OF REVIEW AND ASSESSMENT FOR PM₁₀

The Stage 2 Review and Assessment report concluded that the annual average and hourly PM₁₀ objectives will not be exceeded at relevant locations on the Isle of Wight and a more detailed review is not required.

10.4 SCREENING ASSESSMENT OF PM₁₀

The Technical Guidance LAQM TG(03)³ requires assessment of PM₁₀ to consider the following sources, data or locations:

- Monitoring data outside an AQMA
- Monitoring data within an AQMA
- Busy roads and junctions
- Junctions
- Roads with high flow of buses and/or HGVs
- New roads constructed or proposed since first round of review and assessment
- Roads close to the objective during the first round of review and assessment
- Roads with significantly changed traffic flows
- New industrial sources
- Industrial sources with substantially increased emissions
- Areas with domestic solid fuel burning
- Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc
- Aircraft

These are evaluated in the following sections.

10.5 BACKGROUND CONCENTRATIONS FOR PM₁₀

The estimated average background PM₁₀ concentration for 2001 was 18.1 µg/m³ on the Isle of Wight with maximum concentration of 19.7 µg/m³.

10.6 SCREENING ASSESSMENT OF MONITORING DATA

No monitoring of PM₁₀ is undertaken on the Isle of Wight.

10.7 SCREENING ASSESSMENT OF ROAD TRAFFIC SOURCES

PM₁₀ concentrations from road traffic were estimated using the DMRB model.

Tables 10.2 shows PM₁₀ concentrations for 2004 calculated using traffic count data taken from the NAEI. A traffic growth factor of 1.08 from 2000 to 2004, was used which was calculated from TEMPRO database.

Road	East	North	Distance receptor to road centre m	AADT 2004	Average Speed kph	% HDV	PM ₁₀ Annual mean 2004 µg/m ³	No of exceedences of daily mean
A3020	450000	89500	5	26947	60	4.4	22.4	7
A3020	455000	81700	5	7376	60	4.2	20.2	4
A3020	449600	95000	5	5884	60	3.2	19.8	3
A3020	450600	86900	5	19257	60	5.6	22.3	7
A3020	450300	89000	5	14682	60	4.7	21.7	6
A3021	451060	95000	5	8581	60	4.5	20.5	4
A3021	452000	92461	5	13378	60	4.9	21.5	5
A3021	450400	95590	5	2160	60	4.0	19.2	2
A3021	450200	95550	5	8640	60	4.0	20.4	4
A3021	450250	95640	5	6480	60	4.0	20.0	3
A3021	451919	91906	5	3255	60	4.9	19.5	3
A3054	440000	89160	5	6153	60	5.5	20.1	4

Road	East	North	Distance receptor to road centre m	AADT 2004	Average Speed kph	% HDV	PM ₁₀ Annual mean 2004 µg/m ³	No of exceedences of daily mean
A3054	459201	92640	5	7579	60	4.6	20.3	4
A3054	433400	88000	5	2930	60	6.1	19.4	3
A3054	452000	91724	5	19472	60	2.9	21.6	6
A3054	455000	92060	5	18298	60	4.6	22.0	6
A3054	456000	92330	5	17477	60	4.2	21.8	6
A3054	458930	92540	5	7082	60	3.7	20.1	3
A3054	459100	92520	5	7082	60	3.7	20.1	3
A3054	452239	92036	5	10902	60	6.5	21.3	5
A3054	450800	90400	5	19483	60	4.3	22.0	6
A3055	450000	76250	5	1895	60	3.5	19.1	2
A3055	458500	82000	5	7429	60	4.0	20.2	4
A3055	459950	92710	5	7781	60	3.4	20.2	4
A3055	459260	92580	5	6872	60	5.4	20.2	4
A3055	456400	77600	5	1620	60	3.9	19.1	2
A3055	456400	77510	5	1620	60	3.9	19.1	2
A3055	457470	80000	5	2160	60	4.8	19.2	3
A3056	455000	84240	5	14059	60	4.8	21.6	6
A3201	450350	95550	5	6480	60	4.0	20.0	3

Table 10.2 Estimated PM₁₀ concentrations in 2004 near roads on the Isle of Wight

The DMRB screening run indicates that the 2004 annual mean objective for PM₁₀ of 40 µg/m³ and the 24-hour mean objective of 50 µg/m³ (not to be exceeded more than 35 times per year) are not likely to be exceeded at receptors near A roads on the Isle of Wight.

		Distance receptor to road centre m	AADT 2004	Average Speed kph	% HDV	PM ₁₀ Annual mean 2004 µg/m ³	No of exceedences of daily mean
Ryde	St Johns Hill	14	13741	48	6	21.5	5
Newport	Fairlee Road	12.8	13466	48	6	21.5	6
Newport	Fairlee Road	12.8	25060	48	6	22.5	7
Newport	Horsebridge Hill	10.5	29565	48	6	23.0	8
Newport	Forest Road	12	14090	48	6	21.7	6
Sandown	Broadway	6	14874	48	6	22.3	7
East Cowes	Whippingham Road	6.6	19865	48	6	22.8	8
Newport	Medina Way	25	37265	48	6	21.9	6
Shanklin	Sandown Road	10.7	23822	48	6	22.7	7
Lake	Newport Road	9.6	17528	48	6	22.3	7
Newport	Forest Road	12	15719	48	6	22.0	6
Wootton	High Street	11	22072	48	6	22.5	6
Lake	Lake Hill	9.8	26136	48	6	22.9	8

10.7.1 Narrow congested streets with residential properties close to the kerb

There are no roads on the Isle of Wight meeting this description.

10.7.2 Busy Junctions

There are no junctions on the Isle of Wight with flows of more than 10000 vehicles per day and relevant receptors within 10m.

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

There are no roads on the Isle of Wight meeting this description.

10.8 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

There are no new industrial sources or existing industrial sources with significantly increased emissions since the last review.

10.9 SCREENING ASSESSMENT OF FUGITIVE AND UNCONTROLLED SOURCES

10.9.1 Quarries and landfill sites

There are 10 areas of quarrying activity on the Isle of Wight. These quarries were assessed in the Stage 2 Review and there has been no change since then.

10.9.2 Domestic solid fuel burning

According to the Isle of Wight Council there are no areas of the Isle of Wight where domestic coal burning is a source of PM₁₀.

10.10 SCREENING ASSESSMENT OF OTHER TRANSPORT SOURCES

10.10.1 Airports

There are no airports with a throughput of 5 million passengers per year on or near the Isle of Wight.

10.11 CONCLUSIONS FOR PM₁₀ CONCENTRATIONS IN THE ISLE OF WIGHT

The DMRB screening model indicates that the annual mean objective of 40 µg/m³ for PM₁₀ will be met in 2004. The 24 hour mean objective of 50 µg/m³ is unlikely be exceeded more than 35 times a year in 2004 near roads on the Isle of Wight.

11 Conclusions

11.1 CARBON MONOXIDE

There are no roads on the Isle of Wight which can be classified as 'very busy' with receptors within 20m.

The Isle of Wight Council is not required to carry out a Detailed Assessment for carbon monoxide.

11.2 BENZENE

There are no roads on the Isle of Wight which can be classified as 'very busy' with receptors within 20m. There are no petrol stations with a throughput greater than 2 million litres and with relevant exposure within 10m of the pumps. The only major fuel storage depot on the Isle of Wight is the BP Oils depot in East Cowes which has a throughput of 50 million litres of petrol per annum. There are relevant receptors within 40m of the depot. According to the nomograms in LAQM (TG(03)) there may be a risk of exceeding the 2010 annual mean objective of $5 \mu\text{g}/\text{m}^3$.

The Isle of Wight Council is required to carry out a Detailed Assessment for benzene.

11.3 1,3-BUTADIENE

Estimated background concentrations and data from national monitoring stations indicate that the objective for 1,3-butadiene is likely to be achieved by the end of 2003. There are no industrial processes, current or proposed, on the Isle of Wight which have the potential to emit 1,3-butadiene.

The Isle of Wight Council is not required to carry out a Detailed Assessment for 1,3-butadiene.

11.4 LEAD

Emissions of lead from industrial processes on the Isle of Wight are not likely to exceed the objectives for lead to be achieved in 2004 and 2008.

The Isle of Wight Council is not required to carry out a Detailed Assessment for lead.

11.5 NITROGEN DIOXIDE

The DMRB screening model indicates that the 2005 annual mean objective for NO_2 is unlikely to be exceeded at receptors near roads on the Isle of Wight.

The Isle of Wight Council is not required to carry out a Detailed Assessment for nitrogen dioxide.

11.6 SULPHUR DIOXIDE

There are no significant industrial or domestic sources of sulphur dioxide on the Isle of Wight.

There are a more than 5,000 car ferry movements per year in each of the three main ports on the Isle of Wight. The Isle of Wight Council is recommended to carry out a Detailed Assessment for sulphur dioxide based on car ferry emissions at the ports of Fishbourne, Cowes and Yarmouth.

11.7 PM₁₀

The DMRB screening model indicates that the annual mean objective of 40 µg/m³ for PM₁₀ will be met in 2004. The 24 hour mean objective of 50 µg/m³ is unlikely be exceeded more than 35 times a year in 2004 at locations near roads on the Isle of Wight.

The Isle of Wight Council is not required to carry out a Detailed Assessment for PM₁₀.

12 References

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13 Acknowledgements

We are grateful for the help of William Berry of the Isle of Wight Council in the preparation of this report.

Appendices

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Appendix 1	Traffic Data
Appendix 2	Detailed monitoring data
Appendix 3	Authorised Processes
Appendix 4	Descriptions of DMRB Model

Appendix 1

Road Traffic Data

CONTENTS

Table A1.1 Traffic Data supplied by IOW Council

Table A1.1 Traffic Data supplied by IOW Council

Town	Road	Date	Flows	Average	AADT
Godshill	Newport Road	05/08/2002	2	4528	9056
Ryde	Ashey Downs Road	08/09/2003	2	4603	9206
Newport	Blackwater Road	30/06/2003	1	4942	9884
Ryde	Green Street	01/10/2001	2	4960	9920
Newport	Fairlee Road	09/07/2001	1	5870	11740
Ryde	St Johns Hill	18/05/2001	2	5990	11980
Newport	Forest Road	20/08/2001	2	6142	12284
Sandown	Broadway	01/04/2002	2	6518	13036
Whippingham	Main Road	31/05/2003	2	6932	13864
Newport	Forest Road	23/06/2003	2	6943	13886
Brading	Brading Road	19/08/2002	2	7220	14440
Newport	Carisbrooke Road	29/07/2003	2	7223	14446
Lake	Newport Road	12/05/2003	2	7742	15484
Ryde	Quarr Hill	14/07/2003	2	7995	15990
East Cowes	Whippingham Road	05/08/2002	2	8705	17410
Ryde	Binstead Hill	09/06/2003	1	9710	19420
Wootton	High Street	30/06/2003	1	9749	19498
Wootton	Eleanors Grove	20/08/2001	2	9838	19676
Shanklin	Sandown Road	02/12/2002	2	10439	20878
Newport	Blackwater Road	11/08/2003	2	10568	21136
Newport	Fairlee Road	06/08/2001	2	10924	21848
Newport	Cross Lane	21/05/2001	1	11450	22900
Lake	Lake Hill	28/07/2003	2	11544	23088
Newport	Horsebridge Hill	06/08/2001	2	12888	25776
Newport	Medina Way	05/08/2002	2	16330	32660

Appendix 2

Diffusion Tube Data

CONTENTS

Table A2.1
Table A2.2

Monitoring Locations
Diffusion Tube Results

Table A2.1 Monitoring Locations

Name	Type	East	North
IW4 Sandown High School	B	458600	84600
IW5 Ryde High School	B	458300	91800
IW1 Carisbrooke Castle	B	448400	88800
IW2 Cowes High School	B	449100	94800
IW3 Medina High School	K	450800	90400
IW6 Newport Road Cowes	K	449200	91500
IW7 Fairlee Road Newport	K	450400	98500
IW8 Blackwater Service Station	K	450700	86500
IW9 lake Hill Sandown	K	459200	83700

Table A2.2 Diffusion Tube Results 2002

2002													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep*	Oct	Nov	Dec	Mean
IW1	13.6	8.9	8.7	1.7	7.8	3.4	5.0	6.6	46.2	7.6	13.8	21.0	8.9
IW2	13.6	8.9	9.6	6.1	7.0	4.3	7.4	9.7	57.5	8.4	17.3	22.7	10.5
IW3	22.5	15.1	21.5	12.3		12.2	17.0	16.1	80.8	14.9	27.1	28.8	18.7
IW4	38.6	27.3	31.1	24.5		20.8	19.4			18.3	37.7	37.6	28.4
IW5	17.8	11.2	17.8	5.0	14.8	12.9	13.1	8.0	52.5	8.2	17.3	21.6	13.4
IW6		6.1			9.6	6.7	6.0	6.4	63.8		23.5	22.7	11.6
IW7	10.1	5.6	8.2	2.8	4.4	4.3	4.3	5.1	86.1	6.5	11.5	19.4	7.5
IW8	30.9	29.5	41.1	34.0	17.4	20.2	20.2	18.8	36.3	28.5	44.4	33.8	29.0
IW9	13.7	12.3	11.9	7.8	3.0	12.9	12.9	9.8	28.1	17.2	12.9	23.3	12.5

* Results for September 2002 have been excluded from the mean calculation because they appear anomalously high

Appendix 3

Authorised Processes

CONTENTS

Table A3.1

Part A Processes

Operator Name	Authorisation No.	Site Address	Process Type
INNOGY PLC	AF7169	COWES GT POWER STATION KINGSTON ROAD EAST COWES ISLE OF WIGHT PO32 6JF	combustion processes
CONTRACT HEAT AND POWER LTD	AF8092	FOREST PARK FOREST ROAD NEWPORT ISLE OF WIGHT PO30 5YS	combustion processes
GKN WESTLAND AEROSPACE (HOLDINGS) LTD	AO0504	MARESFIELD WORKS MARESFIELD ROAD EAST COWES ISLE OF WIGHT PO32 6AF	inorganic chemical processes
ISLAND WASTE SERVICES LIMITED	ISL012/10203	BRIDDLESFORD ROAD DOWNEND NEWPORT	landfill sites and waste transfer stations

Appendix 4

Descriptions of DMRB model

CONTENTS

1	Design Manual for Roads and Bridges (DMRB) ⁷
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Design Manual for Roads and Bridges (DMRB)⁷ - This screening method was formulated by the former Department of Transport. The method gives a preliminary indication of air quality near roads, and is more suited to rural motorways and trunk roads than city centre traffic conditions. It is a simple procedure based on tables and nomograms; originally published in August 1994, a revision has been produced in 1999, which is more applicable to urban road situations. The DMRB method requires information on vehicle flow, HGV mix, vehicle speed and receptor-road distances. It contains a useful database of vehicular emission factors for future years.

In the revision of the DMRB method the following pollutants can be estimated:

- the maximum 8-hour mean CO concentration;
- the 98th percentile and the maximum of hourly mean NO₂ concentrations;
- the annual average benzene and annual average 1,3 butadiene concentration;
- the annual mean and the fourth highest daily mean PM₁₀ concentrations.

The method adopts the annual mean concentration as the base statistic. Background pollutant levels are included explicitly in the calculations by adding an amount to the annual mean traffic contribution using the Air Quality Archive (paragraph 6.09) or default values. Surrogate statistics are used to convert annual means to National Air Quality Strategy statistics. Details of the road layout cannot be specified.

