

Report

**Air Quality Updating and
Screening Assessment for
Aberdeenshire Council**

**A report produced for
Aberdeenshire 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 standards^a and their objectives have been enacted through the Air Quality Regulations in 1997, 2000 and 2002². 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 Aberdeenshire Council. The Council 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, and if so, what impact this may have on predicted exceedances 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 exceedance 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 Aberdeenshire Council as outlined in the Government's published guidance.

A First Stage Review and Assessment, revised following the updating of the statutory air quality objectives in Scotland in 2000, concluded that levels of benzene, 1,3-butadiene, carbon monoxide and lead were already below the air quality objective levels. Assessment of sulphur dioxide concluded that levels were already well below the objective levels, and that no significant sources existed within the Council's area, nor in neighbouring districts. The assessment for NO₂ and PM₁₀ concluded that it was unlikely that the objectives would not be achieved in Aberdeenshire. A second stage review and assessment was not therefore undertaken for any pollutants, and no air quality management area has been declared.

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 exceedances of the air quality objectives in locations where relevant 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.

^a 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.

This updating and screening assessment has concluded that:

- Nitrogen dioxide predicted concentrations indicate that the annual average objective is unlikely to be exceeded in 2005, including near busy junctions. This has been confirmed by diffusion tube measurements. There are no significant industrial sources of nitrogen dioxide in Aberdeenshire.
- The DMRB screening model indicates that the annual mean objectives for PM₁₀ will be met in 2004 and in 2010. The 24 hour mean objective of 50 µgm⁻³ will not be exceeded more than 35 times a year in 2004 or 7 times a year in 2010, including in locations close to busy road junctions.

It is concluded that a detailed review and assessment is not needed for nitrogen dioxide and PM₁₀ in Aberdeenshire. However, monitoring of nitrogen dioxide should be continued in order to confirm the above conclusions.

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Appendix 4 Descriptions of selected models and tools

Acronyms and definitions used in this report

AADTF	Annual Average Daily Traffic Flow
ADMS	an atmospheric dispersion model
AQDD	an EU directive (part of EU law) - Common Position on Air Quality Daughter Directives, commonly referred to as the Air Quality Daughter Directive
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
AURN	Automatic Urban and Rural Network (defra funded network)
base case	In the context of this report, the emissions or concentrations predicted at the date of the relevant air quality objective (2005 for nitrogen dioxide)
CO	Carbon monoxide
d.f.	degrees of freedom (in statistical analysis of data)
DETR	Department of the Environment Transport and the Regions (now defra)
defra	Department of the Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EPA	Environmental Protection Act
EPAQS	Expert Panel on Air Quality Standards (UK panel)
EU	European Union
GIS	Geographical Information System
kerbside	0 to 1 m from the kerb
Limit Value	An EU definition for an air quality standard of a pollutant listed in the air quality directives
MWth	Megawatts (thermal)
NAEI	National Atmospheric Emission Inventory produced by netcen on behalf of defra
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NRTF	National Road Traffic Forecast
ppb	parts per billion (1ppb = 1 volume of gas in 10 ⁹ volumes of air)
receptor	In the context of this study, the relevant location where air quality is assessed or predicted (for example, houses, hospitals and schools)
roadside	1 to 5 m from the kerb
SD	standard deviation (of a range of data)
SEPA	Scottish Environment Protection Agency
SO ₂	Sulphur dioxide
TEA	Triethanolamine
TEMPRO	A piece of software produced by the defra used to forecast traffic flow increases
TEOM	Tapered Element Oscillating Microbalance
TEOM (Grav.)	TEOM Measurements expressed as the equivalent value from a gravimetric monitor
USA	Updating and screening assessment
V/V	Volume ratio

Structure of the report

The report is structured as follows:

- **Section 1** summarises the aims of the updating and screening assessment and the approach adopted for the assessment;
- **Section 2** summarises the UK Air Quality Strategy and the function of an updating and screening assessment;
- **Section 3** summarises the conclusions of air quality review and assessment work to date, relevant background information on the Aberdeenshire Council area, relevant emissions-to-air sources, identifies data used in support of this assessment and highlights significant changes in emissions to air within Aberdeenshire since the first round of review and assessment;
- **Sections 4-10** present the review and assessment for each of the seven pollutants included in the Air Quality Regulations;
- **Section 11** presents conclusions and recommendations for further work, where required, for each of the seven pollutants;

1 Introduction to the Updating and Screening Assessment

This section outlines the purpose of this Updating and Screening Assessment for Aberdeenshire 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 exceedances of air quality objectives have 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 exceedances. 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 exceedances 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 exceedance 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 exceedances of the air quality objectives in locations where relevant 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 SCOTTISH EXECUTIVE DOCUMENTATION USED

This report takes into account the guidance in LAQM.TG(03)¹, published February 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	annual mean	31.12.2004
	0.25 µg/m ³	annual mean	31.12.2008
Nitrogen dioxide^b			
	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 µg/m ³	annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)^c			
All authorities	50 µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m ³	annual mean	31.12.2004
Authorities in Scotland only ^d	50 µg/m ³ not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	18 µg/m ³	annual mean	31.12.2010
Sulphur dioxide			
	350 µg/m ³ not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 µg/m ³ not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 µg/m ³ not to be exceeded more than 35 times a year	15 minute mean	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.

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.

2.1.1 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. The standards and associated specific objectives to be achieved between 2003 and 2010 are shown in Table 1.1. The table shows the concentrations with the number of exceedances that are permitted (where applicable).

2.1.2 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)¹ to enable air quality to be monitored, modelled, reviewed and assessed in an appropriate and consistent fashion. This updating and screening assessment has followed 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 current deadline for completion of updating and screening assessments is May 2003, and for detailed assessments April 2004.

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 exceedances of the objectives at any location where public exposure over the relevant averaging period would be unrealistic. Locations should also represent non-occupational exposure.

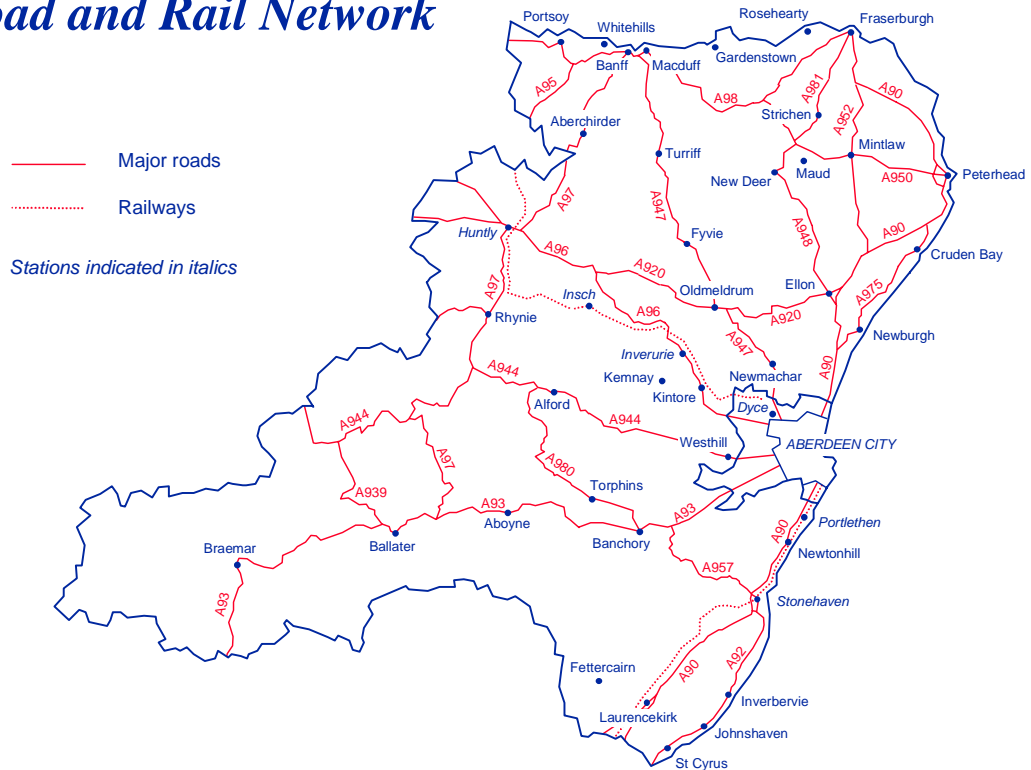
3 Information used to support this assessment

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

3.1 ABERDEENSHIRE COUNCIL'S AREA

Aberdeenshire encompasses a large area of Eastern Scotland around, but not including, the City of Aberdeen. The county is largely rural. Main towns in the area include Fraserburgh, Peterhead, Inverurie and Stonehaven, all relatively small settlements. Figure 3.1 illustrates the Council's area, the main towns, and road network.

Aberdeenshire Road and Rail Network



Based on Ordnance Survey mapping. © Crown copyright reserved. Aberdeenshire Council LA09022L 2003.

Figure 3.1 Aberdeenshire Council's area, road network and main towns

3.2 CONCLUSIONS FROM THE FIRST ROUND OF REVIEW AND ASSESSMENT OF AIR QUALITY FOR ABERDEENSHIRE COUNCIL

Aberdeenshire Council has completed the following review and assessments of air quality to date:

- Stage 1 (March 1999)⁴

The report concluded that second and third Stage review and assessment was not necessary for any pollutants in the strategy, and that Aberdeenshire Council does not need to declare an Air Quality Management Area.

3.3 PROPOSED DEVELOPMENTS WHICH MAY AFFECT AIR QUALITY

3.3.1 Industry

A major expansion of the St Fergus terminal has been proposed. The environmental statement published in February 2002 in support of the planning application for the development concluded that the impact of the expansion on local air quality was insignificant.

No other significant industrial developments currently planned in Aberdeenshire.

3.3.2 Road

A new by-pass around Aberdeen, the Western Peripheral Route is proposed. The majority of the route would fall within Aberdeen City. However, a few stretches, under current proposals, would fall within Aberdeenshire Council's area. To date the impact of the proposed route options on local air quality have not been assessed, as predicted traffic flow data was not available at the time of publication of the Stage 2 assessment report⁸. It will therefore be necessary to review any subsequent air quality impact assessment work, once it becomes available, in future stages of review and assessment.

No other major road developments are currently planned in Aberdeenshire.

3.4 MAPS AND DISTANCES OF RECEPTORS FROM ROADS

Aberdeenshire Council provided electronic OS LandLine™ map data. A standard receptor distance of 10 metres from the road centre line was used in the DMRB modelling assessment.

3.5 ROAD TRAFFIC DATA

This section summarises the information used in this report; more detailed information is given in Appendix 2. Appendix 2 lists the locations of the traffic flow and speed measurement points, flow and speed data and other relevant traffic statistics.

3.5.1 Summary of traffic data provided

Data were collated from a range of sources, including:

- data provided by Aberdeenshire Council for Aberdeenshire area (Figure 3.1)
- data held in the National Atmospheric Emissions Inventory (NAEI, 2000) where no other data were available from either Aberdeenshire Council or the Scottish Executive's Scottish Roads Traffic Database.

Where no average speed data were available, estimated speeds based on speed limits were used. Speeds slower than the national speed limits have been assigned to sections of roads in areas close to junctions.

3.5.2 Fraction of HDVs

Percentages of Cars, LDVs, HDVs and buses were available from the 12-hour manual count data for Aberdeenshire. For other road links, the percentage of HDVs was calculated from the data held in the 2000 National Atmospheric Emissions Inventory.

3.5.3 Base year for traffic

The base year for the traffic flows was 2002.

3.5.4 Traffic growth

Traffic growth figures were based on mid-range TEMPRO growth figures.

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

Distances of receptors from the road centre line were assumed to be 10 metres.

3.6 PART A AND B PROCESSES

There are sixteen Part A and 108 Part B Industrial processes in Aberdeenshire. A full list is given in Appendix 3. Emission data for the processes have been supplied by SEPA where appropriate.

3.7 AMBIENT MONITORING

Aberdeenshire Council have undertaken monitoring of the following pollutants in their area:

- Nitrogen dioxide

Full details of the type, locations, and concentrations recorded by the monitors (diffusion tubes) are given in Appendix 1.

3.7.1 Diffusion tubes

Aberdeenshire Council carry out monitoring of NO₂ by diffusion tubes at a range of locations. The tubes are analysed by Aberdeen City Council, Laboratory of the Public analyst. No collocation with automatic monitors was undertaken.

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 mgm^{-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 mgm^{-3} as the air quality standard for carbon monoxide. The new objective has been set at a slightly tighter level of 10 mgm^{-3} as a running 8-hour mean concentration¹, 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 following conclusions were given for carbon monoxide in the First Stage Review and Assessment for Aberdeenshire:

- National Monitoring data indicate that exceedances of the objective are unlikely to occur in Aberdeenshire
- Current and projected traffic flows are well below those identified as significant by the Technical Guidance (LAQM TG(03)¹);
- There are no significant current or proposed industrial processes in Aberdeenshire or neighbouring areas, that were likely to cause exceedance of the objective;
- National policy measures are expected to deliver the national air quality objective for carbon monoxide by the end of 2003.

The risk of the air quality objective being exceeded was expected to be negligible.

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 (single carriageway roads with average daily flow exceeding 80,000, dual carriageway exceeding 120,000 and motorways exceeding 140,000 vehicles per day)

These are described in the following sections.

4.5 BACKGROUND CONCENTRATIONS FOR CARBON MONOXIDE

No monitoring has been undertaken in Aberdeenshire. There are only three sites in Scotland that monitor carbon monoxide, two in Glasgow and one in Edinburgh.

The average background carbon monoxide concentration estimated from the UK background maps⁵ was 0.13 mgm⁻³ in Aberdeenshire with a maximum concentration of 0.24 mgm⁻³.

4.6 SCREENING ASSESSMENT OF VERY BUSY ROADS

The guidance document LAQM TG(03)¹ requires assessment of CO only at 'very busy roads' (Appendix 2 Table A2.1). Traffic flow data was supplied by Aberdeenshire Council and from the NAEI. Based on these data, there are no roads in Aberdeenshire which can be classified as 'very busy' according to the criteria in the guidance.

4.7 CONCLUSIONS FOR CARBON MONOXIDE CONCENTRATIONS IN ABERDEENSHIRE COUNCIL AREA

There are no roads in Aberdeenshire which can be classified as 'very busy' according to the criteria in the guidance. There are no Part A processes with the potential to emit significant quantities of carbon monoxide. There are no planned developments likely to cause an exceedance.

Aberdeenshire Council is not required to carry out a Detailed Review and 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%. Legislation informed by results from 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 exceedances 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 $16.25 \mu\text{g m}^{-3}$ 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 $5 \mu\text{g m}^{-3}$ to be achieved by the end of 2010 in England and Wales. In Scotland and Northern Ireland, a running annual mean of $3.25 \mu\text{g m}^{-3}$ 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 following conclusions were given for benzene in the First Stage Review and Assessment for Aberdeenshire⁴.

- There is one Part A process, the Cruden Bay Booster Station, which had the potential to emit significant quantities of benzene in terms of Annex 1. However, it was considered that the objective would not be exceeded as the pollutant is not emitted at this site.
- Emissions from vehicles were expected to decrease over the relevant period and national policies are expected to ensure that there will be no exceedances due to petrol stations by 2003;
- Current levels of benzene were estimated to be already below the objective of $16.25 \mu\text{g m}^{-3}$ in Aberdeenshire;
- National policy measures were expected to deliver the national air quality objective for benzene by the end of 2003.

The objective for benzene was not expected to be exceeded in Aberdeenshire.

5.4 SCREENING ASSESSMENT OF BENZENE

The Technical Guidance LAQM TG(03)¹ 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 in Aberdeenshire, estimated from the UK background maps⁵ was $0.06 \mu\text{g m}^{-3}$, with maximum concentration of $0.42 \mu\text{g m}^{-3}$.

5.6 SCREENING ASSESSMENT OF MONITORING DATA

No monitoring of benzene has been undertaken in Aberdeenshire. An urban background monitoring station has been established for several years at the Edinburgh Medical School. Annual average benzene concentrations measured at this station have been consistently significantly below the 2003 objective concentration ($16.25 \mu\text{g m}^{-3}$) and the 2010 value of $3.25 \mu\text{g m}^{-3}$ (Table 5.1).

Table 5.1 Benzene measurements made at Edinburgh Medical School

Year	Benzene $\mu\text{g m}^{-3}$
1994	2.3
1995	2.4
1996	2.3
1997	1.9
1998	1.8
1999	1.2
2000	1.5
2001	2.3

5.7 SCREENING ASSESSMENT OF VERY BUSY ROADS

The guidance document LAQM TG(03)¹ requires assessment of benzene only at 'very busy roads' (Appendix 2 Table A2.1). Traffic flow data were supplied by Aberdeenshire council and from the NAEI. Based on these data, there are no roads in Aberdeenshire which can be classified as 'very busy' according to the criteria in the guidance. The maximum background concentration does not exceed $2.0 \mu\text{g m}^{-3}$.

5.8 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

The Guidance LAQM TG(03) lists the following processes as potential sources of benzene:

Part A (percentage of total emissions from all UK plant in this sector to the UK total in brackets)

- Petroleum processes (73)
- Petrochemical processes (2)
- Carbonisation processes (12)
- Cement/lime manufacture (7)
- Gasification processes (5)

Part B

Processes for the storage and unloading of petrol at terminals

None of the Part A or Part B industrial processes in Aberdeenshire (Appendix 3) operate these processes or have the potential to emit benzene.

The Part A process at Cruden Bay, Peterhead (Crude oil handling) has the potential to emit benzene but is not considered by SEPA to be a significant source in Aberdeenshire⁴, nor have significant changes in emissions been identified since the last round of review and assessment.

5.9 SCREENING ASSESSMENT OF PETROL STATIONS

There are 41 petrol stations in Aberdeenshire authorised as Part B processes (Appendix 3)

The guidance requires petrol stations to be considered only if they are near a busy road, i.e with more than 30,000 vehicles per day and have a throughput greater than 2 million litres. No roads in Aberdeenshire are classified as 'very busy'.

A detailed assessment for benzene is not required based on petrol station emissions.

5.10 SCREENING ASSESSMENT OF FUEL STORAGE DEPOTS

There are no major fuel storage depots in Aberdeenshire.

5.11 CONCLUSIONS FOR BENZENE CONCENTRATIONS IN ABERDEENSHIRE COUNCIL AREA

There are no roads in Aberdeenshire which can be classified as 'very busy' according to the criteria in the guidance. There are no petrol stations with a throughput greater than 2 million litres and with relevant exposure within 10m of the pumps.

Aberdeenshire Council is not required to carry out a Detailed Review and 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 $2.25 \mu\text{g m}^{-3}$. 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 $2.25 \mu\text{g m}^{-3}$ 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 following conclusions were given for 1,3-butadiene in the First Stage Review and Assessment for Aberdeenshire

- There is one Part A process in Aberdeenshire which according to Annexe 1 has the potential to emit 1,3-Butadiene. The nature of the process does not result in emissions of 1,3-Butadiene which would lead to an exceedance of the objective.
- Emissions from vehicles are expected to decrease over the relevant period;
- Current levels of 1,3-butadiene in Aberdeenshire are already below the objective of $2.25 \mu\text{g m}^{-3}$
- National policy measures are expected to deliver the national air quality objective for 1,3-butadiene by the end of 2003.

The objective for 1,3-butadiene was not expected to be exceeded in Aberdeenshire

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 estimated from the UK background maps⁵ was 0.027 $\mu\text{g m}^{-3}$ in Aberdeenshire with maximum concentration of 0.16 $\mu\text{g m}^{-3}$ in Aberdeenshire.

6.6 SCREENING ASSESSMENT OF MONITORING DATA

No monitoring of 1,3-butadiene has been undertaken in Aberdeenshire. An urban background monitoring station was established several years ago at the Edinburgh Medical School. Annual average 1,3-butadiene concentrations measured at this station have been consistently significantly below the objective value of 2.25 $\mu\text{g m}^{-3}$ (Table 6.1).

Table 6.1 1,3-butadiene measurements made at Edinburgh Medical School

Year	1,3-bd $\mu\text{g m}^{-3}$
1994	0.2
1995	0.3
1996	0.2
1997	-
1998	0.2
1999	0.2
2000	0.1
2001	0.2

6.7 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

The Guidance LAQM TG(03) lists the following processes as potential sources of 1,3-butadiene:

Part A (percentage of total emissions from all UK plant in this sector to the UK total in brackets)

Petroleum processes (2)

Petrochemical processes (95)

Organic chemical manufacture (3)

Part B

Rubber processes

There is one Part A process with the potential to emit 1,3-Butadiene. Cruden Bay Booster Station (Crude oil handling). However, SEPA have indicated that emissions of 1,3-butadiene from the process are insignificant⁴, nor have significant changes in emissions been identified since the last round of review and assessment.

6.8 CONCLUSIONS FOR 1,3-BUTADIENE CONCENTRATIONS IN ABERDEENSHIRE COUNCIL AREA

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. The one Part A process with the potential to emit 1,3-Butadiene, Cruden Bay Booster Station, is unlikely to cause an exceedance of the objective.

Aberdeenshire Council is not required to carry out a Detailed Review and 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 following conclusions were given for lead in the First Stage Review and Assessment for Aberdeenshire.

- There were no existing or proposed Part A or B processes in Aberdeenshire, or neighbouring areas, which have the potential to emit significant amounts of lead;
- Levels of lead monitored at Scottish sites were within the UK air quality objective for 2004;
- Estimated current background lead levels in Aberdeenshire were already below the UK air quality objective for 2004;
- National policy measures are expected to deliver the national air quality objective for lead by 2004 and 2008.

The objectives for lead were not expected to be exceeded in Aberdeenshire.

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 in Aberdeenshire.

7.6 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

The Guidance LAQM TG(03) lists the following processes as potential sources of lead:

Part A (percentage of total emissions from all UK plant in this sector to the UK total in brackets)
Iron and steel (37)
Non-ferrous metals (23)
Manufacture of organic chemicals (35)

Part B

Non-ferrous metal furnaces
Electrical furnaces
Blast cupolas
Aluminium processes
Zinc Processes
Copper processes
Lead glass manufacture

The only process with the potential to emit lead in Aberdeenshire is the Part A Crude Bay Booster Station (Crude oil handling) (Appendix 3). This plant was identified as a potential source of lead in the last round of Review and Assessment report. Aberdeenshire Council are not aware of any changes to the output of this plant since that report. Lead is not emitted to the atmosphere as part of the process of the site⁴, nor have significant changes in emissions been identified since the last round of review and assessment.

7.7 CONCLUSIONS FOR LEAD CONCENTRATIONS IN ABERDEENSHIRE COUNCIL AREA

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

Aberdeenshire Council is not required to carry out a Detailed Review and Assessment for lead.

8 Updating and Screening Assessment for Nitrogen Dioxide

8.1 THE NATIONAL PERSPECTIVE

The principal source of oxides of nitrogen 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^m⁻³, and a 1-hour mean concentration of 200 µg^m⁻³ 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 following conclusions were given for nitrogen dioxide in the First round of Review and Assessment for Aberdeenshire:

- Predicted mean background concentrations of oxides of nitrogen were less than 10 µg^m⁻³;
- Emissions from industrial processes in Aberdeenshire and neighbouring areas were unlikely to cause exceedance of the objectives;
- Emissions from traffic or other transport sources in Aberdeenshire and neighbouring areas are unlikely to cause exceedance of the objectives;
- Further monitoring data should be compiled at congested junctions and streets in Aberdeenshire to assess the effect of traffic control measures;
- National policy measures are expected to significantly reduce emission from road traffic by 2005.

Local emissions of nitrogen oxides were unlikely to cause exceedance of the objectives in Aberdeenshire.

8.4 SCREENING ASSESSMENT OF NITROGEN DIOXIDE

The Technical Guidance LAQM TG(03)¹ 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 estimate from the UK Background maps⁵ was 4.73 $\mu\text{g}\text{m}^{-3}$ in Aberdeenshire with a maximum concentration of 18.7 $\mu\text{g}\text{m}^{-3}$ measured by the A90 outside Aberdeen city.

8.6 SCREENING ASSESSMENT OF MONITORING DATA

8.6.1 Diffusion tube monitoring

Three monitoring sites at Stonehaven form part of the UK national survey. A number of other diffusion tubes sites are also operated by Aberdeenshire Council (Appendix 1 Table A1.1). Annual mean NO₂ diffusion tube measurements from 2001 and 2002 are given in Table 8.1 below, along with estimated concentrations for 2005, derived using the factors provided in LAQM.TG(03).

8.6.2 Diffusion tube analysis

Aberdeenshire Council tubes were analysed by Aberdeen City Council, Laboratory of the Public Analyst. They were prepared using 50% v/v TEA in Acetone methodology. In intercomparison exercises reported by Air Quality Consultants⁷ for 12 months during 2001, these tubes were found to underread by 25%. In contrast, in the UK NO₂ Network Field Intercomparison Exercise 2001 the results of Aberdeen City Council, Laboratory of the Public Analyst, showed an over-read bias of between 12% and 26% relative to the reference value as determined by an automatic chemiluminescence method. The period of this intercomparison was 5 September – 31 October 2001.

8.6.3 Bias correction of diffusion tube data

There is no automatic analyser and diffusion tube co-location data available for Aberdeenshire to enable the bias correction of the diffusion tube data.

Table 8.1 Aberdeenshire nitrogen dioxide diffusion tube data 2002, adjusted to 2005 (Exceedences of 2005 Limit Value in Bold)

<i>Monitoring Locations</i>	<i>Site Type</i>	2001 Mean	2005 Estimate Based on 2001 data	2002 Mean	2005 Estimate based on 2002 data
Peterhead 1(Broad St)	Kerbside	-	-	14.5	13.3
Peterhead 2 (Queen St)	Kerbside	21.0	18.7	16.0	14.7
Fraserburgh 1(Saltoun Sq)	Kerbside	11.8	10.5	24.5	22.5
Fraserburgh 2(Kirk Brae)	Kerbside	13.8	12.3	20.3	18.7
Inverurie 1 (High St)	Kerbside	25.4	22.6	34.0	31.3
Inverurie 2 (Gordon House)	Intermediate	11.2	10.2	12.4	11.4
Inverurie 3 (St Andrews)	Background	10.7	10.9	13.3	12.2
Inverurie 4 (Ury Dale)	Background	8.8	8.4	11.2	10.3
Westhill 1 (Arnhall Cres)	Background	9.2	8.8	12.1	11.1
Westhill 2 (Straik Rd)	Kerbside	11.6	10.3	40.4	37.2
Stonehaven 1 (Allardice St)	Kerbside	17.9	15.9	25.0	23.0
Stonehaven 2 (St Bridget Cres)	Background	9.0	8.2	11.6	10.7
Stonehaven 3 (Hunter Dr)	Background	8.9	10.7	13.2	12.1

It can be seen that, with one exception at Straik Road, Westhill 2, both current and future predicted annual mean NO₂ concentrations are well below 40µmg⁻³. One high monthly value of 115 µmg⁻³ was noted in December 2002 at Westhill 2 Site (Straik Road). However, all other monthly readings at this site are low throughout 2001 and 2002 (see Appendix 1, Table A1.2) and this reading appears unlikely to be representative. Furthermore only 5 months of data capture were achieved in 2002, compared with 9 months data capture in 2001. The 2001 annual average value is therefore more likely to be representative of typical NO₂ levels at this site. Aberdeenshire Council also reported that no relevant exposure exists along this road near this kerbside site.

Also. Should the diffusion tubes be found to be under-reading by up to 25%, NO₂ concentrations at Inverurie 1 site (High Street) may also be close to the standard in some years, though again, the 2001 annual average is much lower than the 2002 average. Further monitoring should provide adequate clarification of the situation at these sites.

8.6.4 Automatic Monitoring

No automatic monitoring has been carried out in Aberdeenshire.

8.7 SCREENING ASSESSMENT OF ROAD TRAFFIC SOURCES

Traffic flow data were taken from the NAEI 2000 roads database (Appendix 2 table A2.2) and from manual and automatic Scoot traffic count data taken in 2002 for local roads (Table A2.3) and busy roads (roads under strain) (Table A2.4) in Aberdeenshire. NAEI AADF 2000 data was modelled using DMRB. Selected busy roads data, as reported by Aberdeenshire Council was also modelled.

For screening purposes, receptor distances were assumed to be 10 metres from the road centre line. Speeds were modelled at approximately maximum speeds. A TEMPRO traffic growth factor of 1.039 for between 2002 and 2005 was used for local roads. A factor of 1.059 for between 2000 and 2005 for roads under strain was used.

Table 8.2 shows nitrogen dioxide concentrations in 2005 calculated using DMRB for a selection of A roads and in Aberdeenshire.

Table 8.2 Estimated nitrogen dioxide concentrations on roads under strain in Aberdeenshire

Road	Location	Distance receptor to road centre m	AADT 2005*	Average Speed kph	%HDV	NO ₂ Annual mean 2005 $\mu\text{g m}^{-3}$
A90	S of Glasslaw	10	17746	100	15.0	18.1
A90	N of Stonehaven	10	23948	100	15.0	18.8
A90	Muchalls	10	24726	100	15.0	18.9
A90	S of Charleston	10	42659	100	15.0	20.4
A90	Balmedie	10	17474	100	15.0	18.0
A90	N of A975	10	14972	100	15.0	17.5
A96	Tyrebagger	10	18312	100	15.0	18.1
A96	Blackburn Bypass	10	17650	100	15.0	18.1
A96	Kintore Bypass	10	17559	100	15.0	18.0
A96	S of Thainstone	10	17852	100	15.0	18.1
A96	S of Elphinstone	10	23788	100	15.0	18.8
A96	S of Blackhall	10	14753	100	15.0	17.4
A944	E of Westhill	10	15251	100	15.0	17.6
A947	S of Newmachar	10	11143	100	15.0	16.2
A947	Urqhart Rd, Oldmeldrum	10	7547	100	15.0	15.0
A948	Station Rd, Ellon	10	12341	100	15.0	16.6
A950	E of Peripheral Road	10	8299	100	15.0	15.2
B977	Broomhill, Lyne of Skene	10	3627	50	15.0	13.2
B979	Wester Ord	10	3905	50	15.0	13.3
PETERHEAD	South Road	10	9550	50	15.0	14.5
ELLON	Bridge Street	10	10796	50	15.0	14.8
ELLON 2	South Road	10	12342	50	15.0	15.2
INVERURIE	High St	10	12878	50	15.0	15.3

*Base year 2000. TEMPRO growth factor 1.059 used.

The DMRB screening model indicates that the 2005 annual mean objective for NO₂ is unlikely to be exceeded at receptors on roads under strain.

Table 8.3 shows nitrogen dioxide concentrations for 2005 calculated using DMRB for local roads in Aberdeenshire. TEMPRO growth factor of 1.039 to 2005 was used. Receptor distances to road centrelines were taken to be the minimum distance of 10 metres.

No street canyons have been reported by Aberdeenshire Council in Aberdeenshire.

Table 8.3 Estimated nitrogen dioxide concentrations near local roads in Aberdeenshire

Road	East	North	Distance receptor to road centre m	AADT 2005*	Average Speed kph	% HDV	NO ₂ Annual mean 2005 µgm ⁻³
B9077	390460	802375	10	5622	50	15	12.6
A98	392470	862575	10	2455	100	15	12.4
A98	383335	856725	10	3784	100	15	12.7
A944	373735	809525	10	1754	100	15	12.1
B9119	373365	805665	10	2730	50	15	12.5
A948	394080	834290	10	4644	100	15	12.8
A947	389050	818520	10	1203	100	15	12.1
A947	375085	842020	10	6733	100	15	12.8
B979	382755	813560	10	1483	50	15	12.2
B979	385005	795225	10	3516	50	15	12.4
B979	381915	804825	10	2568	50	15	12.4
B9170	377830	822975	10	9993	50	15	13.9
A981	396720	861720	10	3403	100	15	12.6
A950	388200	856015	10	4580	100	15	12.8
A950	409785	846365	10	6676	100	15	13.2
A920	384760	826995	10	4653	100	15	12.5
A93	380845	800250	10	4843	100	15	12.9
B9001	373645	829055	10	1336	50	15	12.2
A92	386575	784145	10	790	100	15	12.0
A957	375245	795635	10	2301	100	15	12.4
B999	385990	831335	10	4536	50	15	12.5
B977	391810	815920	10	4292	50	15	12.5

* Base year 2002. TEMPRO growth factor 1.039 used.

8.7.1 Busy Junctions

No busy junctions have been reported or indicated by Aberdeenshire council. DMRB was modelled using selected junctions identified from a 1:25,000 map. Highest AADF flows for linked roads were assumed. Receptor to road centre line distances were assumed to be 10 metres and speeds were modelled at half maximum speed.

Table 8.4 Estimated nitrogen dioxide concentrations in 2005 at selected road links in Aberdeenshire

Road Link	Distance receptor to road centre m	AADT 2005	Average Speed KPH	% HDV	NO ₂ annual mean 2005 µmg ⁻³
A947/A920	10	9993	50	15	
Oldmeldrum	10	3403	50	15	15.0
A980/A93	10	4759	50	15	
Banchory	10	6281	50	15	13.4
A920/A948	10	9256	50	15	
Ellon	10	6327	50	15	16.9
A98/A92	10	12140	50	15	
Fraserburgh	10	4324	50	15	16.7

The DMRB screening model indicates that the 2005 annual mean objective for NO₂ is unlikely to be exceeded.

8.8 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

The Guidance LAQM TG(03)¹ lists the following processes as potential sources of nitrogen dioxide:

Part A (percentage of total emissions from all UK plant in this sector to the UK total in brackets)

Iron and steel (19)

Petroleum processes (16)

Combustion processes (34)

Cement/lime manufacture (9)

Carbonisation (6)

Gasification (4)
Inorganic chemicals (4)

Part B

Glass manufacture

The only Part A processes in Aberdeenshire which have a potential source of nitrogen dioxide are Peterhead Power Station and St Fergus Gas Terminal. Aberdeenshire Council have not identified any changes to the output of this plant since the first stage review and assessment stage. No Part B processes in Aberdeenshire are potential significant sources of nitrogen dioxide.

8.9 SCREENING ASSESSMENT OF OTHER TRANSPORT SOURCES

8.9.1 Bus Stations

No major bus stations were identified in the Aberdeenshire area.

8.9.2 Airports

There are no airports in Aberdeenshire or neighbouring authorities that have a throughput of 5 million passengers per year and/or 500,000 tonnes of freight.

8.10 CONCLUSIONS FOR NITROGEN DIOXIDE CONCENTRATIONS IN ABERDEENSHIRE COUNCIL AREA

Nitrogen dioxide predicted concentrations indicate that the annual average objective will not be exceeded in 2005, including near busy roads and junctions. This has been confirmed from the diffusion tube measurements. There are no significant industrial sources of nitrogen dioxide in Aberdeenshire.

Aberdeenshire Council is not required to carry out a Detailed Review and 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 exceedances 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 $266 \mu\text{g m}^{-3}$ 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 $350 \mu\text{g m}^{-3}$, to be exceeded no more than 24 times per year, and a 24-hour objective of $125 \mu\text{g m}^{-3}$, 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 following conclusions were given for SO_2 in the First Stage Review and Assessment report for Aberdeenshire:

- There were no current or proposed significant industrial sources of sulphur dioxide at relevant locations in Aberdeenshire;
- Emissions from industry were not considered to have any significant effect either individually or cumulatively and in conjunction with ambient background concentrations of sulphur dioxide on air quality at relevant locations in Aberdeenshire;

The risk of exceeding air quality objectives for sulphur dioxide was considered to be negligible.

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 from UK Background maps⁵ was $0.87 \mu\text{g}\text{m}^{-3}$ with maximum concentration of $6.7 \mu\text{g}\text{m}^{-3}$ in Aberdeenshire.

9.6 SCREENING ASSESSMENT OF MONITORING DATA

No monitoring for Sulphur dioxide has been carried out in Aberdeenshire.

9.7 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

The Guidance LAQM TG(03)¹ lists the following processes as potential sources of sulphur dioxide:

Part A (percentage of total emissions from all UK plant in this sector to the UK total in brackets)

- Iron and steel (9)
- Petroleum processes (15)
- Combustion processes (45)
- Cement/lime manufacture (3)
- Carbonisation (10)
- Non-ferrous metals (7)
- Ceramic Production (9)

Part B

- Combustion plant 20-50 mwth
- Furnaces 20-50 mwth
- Copper processes
- Refractory goods
- Glass manufacture
- Roadstone coating

The only Part A process in Aberdeenshire which is a potential source of sulphur dioxide is the Peterhead Power station. This plant was not identified as a significant source of sulphur dioxide in the First round of Review and Assessment and Aberdeenshire Council are not aware of any changes to the output of this plant since the report. SEPA does not consider that any of the processes are likely to emit significant concentrations of SO_2 . The only Part B processes in Aberdeenshire that are potential sources of sulphur dioxide are the roadstone coating plants at Balmedie, Craigenlow, Craighash, Pitcaple and Tom's Forest quarries. Data are not available on SO_2 emissions from these processes. However, SEPA does not consider them significant sources of SO_2 ⁴ and Aberdeenshire Council have not identified any changes to the emissions of these plants since the last review and assessment round.

9.8 DOMESTIC COAL BURNING

In discussion with Aberdeenshire Council, significant areas of domestic coal burning were not identified in the area.

9.9 SCREENING ASSESSMENT OF OTHER TRANSPORT SOURCES

9.9.1 Shipping

There are approximately 2300 major shipping movements per year from Peterhead. This is significantly less than the 5000 movements requiring a detailed assessment to be undertaken. The 5000 movements is exceeded by the addition of fishing vessels. The Guidance LAQM TG(03)¹ does not list small vessels, so these have not been assessed.

9.9.2 Railways

It has been assumed that there are no railway stations in the Aberdeenshire Council area with a throughput of more than 150 trains per day and that there are no receptors within 80 metres of such

stations. It is therefore considered that SO₂ emissions from rail movements are not significant in the Aberdeenshire area.

9.10 CONCLUSIONS FOR SULPHUR DIOXIDE CONCENTRATIONS IN ABERDEENSHIRE COUNCIL AREA

There are no significant industrial or domestic sources of sulphur dioxide in Aberdeenshire.

Aberdeenshire Council is not required to carry out a Detailed Review and Assessment for sulphur dioxide.

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 m⁻³ 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 m⁻³ as the annual mean, and 50 µg m⁻³ 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 m⁻³ as the fixed 24-hour mean to be exceeded on no more than 7 days per year, and 18 µg m⁻³ as the annual mean to be achieved by the end of 2010 which applies to Scottish Authorities only. 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 following conclusions were given for PM₁₀ in the First round of Review and Assessment for Aberdeenshire:

- Predicted annual mean background concentrations of PM₁₀ were below 25 µg m⁻³;
- PM₁₀ emissions from domestic solid fuel burning are unlikely to cause exceedance of the objectives;
- Emissions from industrial processes in Aberdeenshire, and neighbouring areas, are unlikely to cause exceedance of the objectives;
- Emissions from industrial processes in neighbouring areas are unlikely to cause exceedance of the objectives in Aberdeenshire;
- Emissions from traffic or other transport sources are unlikely to cause exceedance of the objectives in Aberdeenshire;
- Emissions from uncharacterised activities are unlikely to cause exceedance of the objectives in Aberdeenshire.

Local emissions of PM₁₀ were considered unlikely to cause exceedance of the objectives in Aberdeenshire.

10.4 SCREENING ASSESSMENT OF PM₁₀

The Technical Guidance LAQM TG(03)¹ 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 in Scotland
- 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 2004 from UK Background maps⁵ was 12.5 µgm⁻³ in Aberdeenshire with maximum concentration of 15.6 µgm⁻³ in Aberdeenshire near the A96 at Port Elphinstone.

10.6 SCREENING ASSESSMENT OF MONITORING DATA

No PM₁₀ monitoring is currently carried out by Aberdeenshire Council.

10.7 SCREENING ASSESSMENT OF ROAD TRAFFIC SOURCES

Traffic flow data were taken from the NAEI 2000 roads database (Appendix 2 Table 2.2) and from manual and from automatic Scoot traffic count data taken in 2002 for local roads in Aberdeenshire and busy roads (roads under strain) supplied by Aberdeenshire Council (Appendix 2 Tables A2.3 and A2.4).

For screening purposes receptor distances were assumed to be 10 metres from road centre line and approximate speed limits for the road were used. TEMPRO traffic growth factors of 1.026 between 2002 and 2004 and 1.10 between 2002 and 2010 were used for local roads. Growth factors of 1.046 between 2000 and 2004 and 1.122 between 2000 and 2010 for roads under strain were used.

Table 10.1 shows PM₁₀ concentrations in 2004 and 2010 calculated using DMRB for roads under strain in Aberdeenshire. No exceedances of the 24 hour mean air quality objective for PM₁₀ in 2004 or 2010 are predicted at roads under strain in the Aberdeenshire area.

Table 10.1 Estimated PM₁₀ concentrations on roads under strain in Aberdeenshire

Road	Location	Distance receptor to road centre m	AADT 2004*	Speed KPH	%HDV	PM ₁₀ annual mean μgm^{-3}	
						2004	2010
A90	S of Glasslaw	10	17528	100	15	18.4	15.2
A90	N of Stonehaven	10	23654	100	15	19.2	15.6
A90	Muchalls	10	24423	100	15	19.3	15.7
A90	S of Charleston	10	42135	100	15	20.9	16.6
A90	Balmedie	10	17259	100	15	18.4	15.2
A90	N of A975	10	14789	100	15	17.9	14.9
A96	Tyrebagger	10	18087	100	15	18.5	15.2
A96	Blackburn Bypass	10	17433	100	15	18.4	15.2
A96	Kintore Bypass	10	17344	100	15	18.4	15.2
A96	S of Thainstone	10	17633	100	15	18.5	15.2
A96	S of Elphinstone	10	23496	100	15	19.2	15.6
A96	S of Blackhall	10	14572	100	15	17.8	14.8
A944	E of Westhill	10	15063	100	15	18.0	14.9
A947	S of Newmachar	10	11006	100	15	16.5	14.1
A947	Urqhart Rd, Oldmeldrum	10	7454	100	15	15.2	13.4
A948	Station Rd, Ellon	10	12189	100	15	16.9	14.3
A950	E of Peripheral Road	10	8198	100	15	15.5	13.5
B977	Broomhill, Lyne of Skene	10	3582	50	15	13.4	12.4
B979	Wester Ord	10	3857	50	15	13.4	12.4
PETERHEAD	South Road	10	9432	50	15	14.8	13.1
ELLON	Bridge Street	10	10663	50	15	15.1	13.3
ELLON 2	South Road	10	12191	50	15	15.5	13.5
INVERURIE	High St	10	12720	50	15	15.6	13.5

* Base year 2000

Traffic data for local roads in Aberdeenshire were supplied by the Council. Tables 10.2 and 10.3 show PM₁₀ concentrations for 2004 and 2010 calculated using DMRB. Receptor distances were assumed to be 10 metres and traffic speeds were modelled in DMRB at approximate speed limits. No exceedances of the 24 hour mean air quality objective for PM₁₀ in 2004 or 2010 are predicted at local roads in the Aberdeenshire area.

Table 10.2 Estimated PM₁₀ concentrations 2004 near local roads in Aberdeenshire

Road	Distance receptor to road centre m	AADT 2004*	Average Speed KPH	% HDV	PM ₁₀ Annual mean $\mu\text{g}\text{m}^{-3}$ 2004
B9077	10	5552	50	15	14.1
A98	10	2424	100	15	13.5
A98	10	3737	100	15	14.1
A944	10	1732	100	15	13.0
B9119	10	2696	50	15	13.7
A948	10	4586	100	15	14.5
A947	10	1188	100	15	12.8
A947	10	6649	100	15	14.4
B979	10	1465	50	15	13.1
B979	10	3472	50	15	13.5
B979	10	2536	50	15	13.6
B9170	10	9868	50	15	16.8
A981	10	3361	100	15	14.0
A950	10	4523	100	15	14.5
A950	10	6592	100	15	15.4
A920	10	4595	100	15	13.8
A93	10	4782	100	15	14.6
B9001	10	1319	50	15	13.1
A92	10	780	100	15	12.7
A957	10	2272	100	15	13.5
B999	10	4480	50	15	13.8
B977	10	4238	50	15	13.7

* Base year 2002

Table 10.3 Estimated PM₁₀ concentrations 2010 near local roads in Aberdeenshire

Road	Distance receptor to road centre m	AADT 2010*	Average Speed kph	% HDV	PM ₁₀ Annual mean $\mu\text{g}\text{m}^{-3}$ 2010
B9077	10	5952	50	15	12.8
A98	10	2599	100	15	12.5
A98	10	4006	100	15	12.8
A944	10	1857	100	15	12.2
B9119	10	2891	50	15	12.5
A948	10	4917	100	15	13.0
A947	10	1274	100	15	12.1
A947	10	7128	100	15	12.9
B979	10	1570	50	15	12.3
B979	10	3722	50	15	12.4
B979	10	2719	50	15	12.5
B9170	10	10579	50	15	14.3
A981	10	3603	100	15	12.7
A950	10	4849	100	15	13.0
A950	10	7068	100	15	13.5
A920	10	4926	100	15	12.6
A93	10	5127	100	15	13.0
B9001	10	1415	50	15	12.2
A92	10	837	100	15	12.0
A957	10	2436	100	15	12.4
B999	10	4803	50	15	12.6
B977	10	4544	50	15	12.6

* Base year 2002

10.7.1 Busy Junctions

No busy junctions have been reported or indicated by Aberdeenshire Council. Annual average PM₁₀ concentrations at receptors near busy road junctions in Aberdeenshire have been estimated for 2004 and 2010 using DMRB. DMRB was modelled using selected junctions identified using a 1:25,000 map. Highest AADF flows for linked roads were assumed. Receptor distances were assumed to be 10 metres from the road centreline and speeds were modelled at half maximum speed limits.

Table 10.4 Estimated PM₁₀ concentrations in 2004 and 2010 at potentially busy road junctions in Aberdeenshire.

Road Link	Distance receptor to road centre m	AADT 2004	AADT 2010	Average Speed KPH	% HDV	PM ₁₀ annual mean 2004 μmg^{-3}	PM ₁₀ annual mean 2010 μmg^{-3}
A947/A920	10	9868	10579	50	15		
Oldmeldrum	10	3361	3603	50	15	17.1	14.2
A980/A93	10	4791	5130	50	15		
Banchory	10	6324	6771	50	15	16.3	13.8
A920/A948	10	7226	7738	50	15		
Ellon	10	9330	9990	50	15	18.1	14.8
A98/A92	10	11991	12839	50	15		
Fraserburgh	10	4271	4574	50	15	18.0	14.7

No exceedances of the 24 hour mean air quality objective for PM₁₀ in 2004 or 2010 are predicted at potentially busy junctions in the Aberdeenshire area. DMRB screening indicates there will be no exceedances of the annual mean objective of 40 μgm^{-3} close to potentially busy junctions in Aberdeenshire in 2004 and no exceedances of the annual mean objective of 18 μgm^{-3} in 2010.

10.8 SCREENING ASSESSMENT OF INDUSTRIAL SOURCES

The Guidance LAQM TG(03)¹ lists the following processes as potential sources of PM₁₀:

Part A (percentage of total emissions from all UK plant in this sector to the UK total in brackets)

- Iron and steel (61)
- Petroleum processes (4)
- Combustion processes (13)
- Cement/lime manufacture (7)
- Carbonisation (2)
- Gasification (4)
- Non-ferrous metals (4)
- Fertilizer production

Part B

- Combustion plant 20-50 MWth
- Furnaces 20-50 mwth
- Coal and coke processes
- Quarry Process
- Roadstone coating
- Rubber processes
- China and clay processes
- Coating powder
- Coil coating

There are three Part A process in Aberdeenshire which are potential sources of PM₁₀; Peterhead power station, Inverurie Paper Mill and Cruden Bay Booster station. No data has been made available for PM₁₀ from these processes. These plants were not identified as a source of PM₁₀ in the First round Review and Assessment report. No changes to the output of these plants have been identified by Aberdeenshire Council since the last round of Review and Assessment. SEPA confirmed that they are not significant sources of PM₁₀ emissions to air⁴.

Of the Part B processes listed in Appendix 3, 22 are potential sources of PM₁₀. SEPA have not identified any sites as significant sources of PM₁₀⁴

10.9 SCREENING ASSESSMENT OF FUGITIVE AND UNCONTROLLED SOURCES

No quarries or fugitive sources were identified in the Aberdeenshire Council area with the potential for significant PM₁₀ emissions.

10.10 SCREENING ASSESSMENT OF OTHER TRANSPORT SOURCES

10.10.1 Airports

There are no airports in Aberdeenshire or neighbouring authorities that have a throughput of 5 million passengers per year and/or 500,000 tonnes of freight.

10.11 CONCLUSIONS FOR PM₁₀ CONCENTRATIONS IN ABERDEENSHIRE COUNCIL AREA

The DMRB screening model indicates that the annual mean objective of 40 µg m⁻³ for PM₁₀ will be met in 2004. The 24 hour mean objective of 50 µg m⁻³ will not be exceeded 35 times in 2004 or 7 times in 2010. The annual mean objective of 18 µg m⁻³ will not be exceeded in 2010.

Aberdeenshire Council is not required to carry out a Detailed Review and Assessment for PM₁₀.

11 Conclusions

11.1 CARBON MONOXIDE

There are no roads in Aberdeenshire which can be classified as 'very busy' according to the criteria in the guidance.

A detailed assessment is not required for carbon monoxide in Aberdeenshire.

11.2 BENZENE

There are no roads in Aberdeenshire that are 'very busy' roads according to the criteria in the guidance. There are no petrol stations with a throughput greater than 2 million litres and with relevant exposure within 10m of the pumps.

A detailed assessment is not required for benzene in Aberdeenshire.

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, in Aberdeenshire which have the potential to emit 1,3-butadiene.

A detailed assessment is not required for 1,3-butadiene in Aberdeenshire.

11.4 LEAD

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

A detailed assessment is not required for lead in Aberdeenshire.

11.5 NITROGEN DIOXIDE

Nitrogen dioxide diffusion tube measurements, and estimates of concentrations from DMRB modelling, indicate that the annual average objective is unlikely to be exceeded in 2005. There are no significant industrial sources of nitrogen dioxide in Aberdeenshire.

A detailed assessment is not required for nitrogen dioxide.

11.6 SULPHUR DIOXIDE

There are no significant industrial or domestic sources of sulphur dioxide in Aberdeenshire.

A detailed assessment is not required for sulphur dioxide.

11.7 PM₁₀

The DMRB screening model indicates that the annual mean and daily mean objectives for PM₁₀ will be met in 2004 and 2010.

A detailed assessment is not required for PM₁₀.

11.8 SUMMARY AND RECOMMENDATIONS

None of the air quality objectives in the Air Quality Regulations for Scotland are predicted to be exceeded by the relevant dates. The annual average nitrogen dioxide objective is unlikely to be exceeded in 2005 in Aberdeenshire. The annual average and daily average PM₁₀ objectives are unlikely to be exceeded in 2004 or 2010 in Aberdeenshire.

It is recommended that diffusion tube monitoring of NO₂ continues in the Aberdeenshire Council area in order to confirm the above conclusions for NO₂.

12 References

1. Part IV of the Environment Act 1995. Local Air Quality Management. LAQM.TG(03) February 2003.
2. The Air Quality (Scotland) Amendment Regulations 2002, ISBN 0 11061468 2.
3. DETR (2000b) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Department of the Environment, Transport and the Regions. Cm 4548, SE 2000/3, NIA 7.
4. Aberdeenshire Council (1999) First Stage Air Quality Review & Assessment. Aberdeenshire Council, May 1999.
5. Maps of Estimated Ambient Air Pollution in 2001 and Projections for Other Years. <http://www.airquality.co.uk/archive/laqm/tools.php>
6. Design Manual For Roads and Bridges Highways Agency 2003
7. Compilation of Diffusion Tube Collocation Studies Carried out by Local Authorities, AQC, 2002
8. Western Peripheral Route (Northern Leg), Stage 2 Addendum Air Quality and Traffic Noise and Vibration Assessments, Mouchel, March 2003
9. Environmental Statement: St Fergus Terminal Modifications for Goldeneye – Addendum, Shell UK Exploration and Production, February 2002

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Appendices

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Appendix 1

Detailed Monitoring data

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Table A1.1	Diffusion Tube Monitoring Site Details in Aberdeenshire
Table A1.2	Monthly average NO ₂ concentrations in Aberdeenshire 2002

Table A1.1 Diffusion Tube Monitoring Site Details in Aberdeenshire

Site Number	Site Type	Address
Peterhead 1	K	Broad Street
Peterhead 2	K	Queen Street
Fraserburgh 1	K	Saltoun Square
Fraserburgh 2	K	Kirk Brae
Inverurie 1	K	High Street
Inverurie 2	I	Gordon House
Inverurie 3	B	St Andrews
Inverurie 4	B	Ury Dale
Westhill 1	B	Arnhall Crescent
Westhill 2	K	Straik Road
Stonehaven 1	K	Allardice Street
Stonehaven 2	B	St Bridget Crescent
Stonehaven 3	B	Hunter Drive

K – Kerside; I – Intermediate; B - Background

Table A1.2a Monthly average NO₂ concentrations at sites in Aberdeenshire 2001, projected to 2005

<i>Monitoring Locations</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Mean</i>	2005 Estimate
Peterhead 1(Broad St)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peterhead 2 (Queen St)	-	-	-	-	-	-	-	20	-	22	-	-	21.0	18.7
Fraserburgh 1(Saltoun Sq)	-	-	-	-	-	-	12	11	-	14	-	10	11.8	10.5
Fraserburgh 2(Kirk Brae)	-	-	-	-	-	-	5	12	-	19	-	19	13.8	12.3
Inverurie 1 (High St)	28	41	13	21	23	24	26	24	21	30	-	28	25.4	22.6
Inverurie 2 (Gordon House)	17	12	8	6	-	8	8	9	14	12	-	18	11.2	10.2
Inverurie 3 (St Andrews)	17	9	6	9	5	5	8	17	13	12	-	17	10.7	10.9
Inverurie 4 (Ury Dale)	14	5	7	10	5	6	7	7	10	12	-	14	8.8	8.4
Westhill 1 (Arnhall Cres)	-	7	9	9	5	6	8	8	11	12	-	17	9.2	8.8
Westhill 2 (Straik Rd)	-	18	7	11	5	8	11	9	-	15	-	20	11.6	10.3
Stonehaven 1 (Allardice St)	12	12	13	20	-	-	22	22	18	-	24	-	17.9	15.9
Stonehaven 2 (St Bridget Cres)	11	7	-	-	-	-	-	-	-	-	-	-	9.0	8.2
Stonehaven 3 (Hunter Dr)	17	5	5	5	-	-	-	9	6	-	15	-	8.9	10.7

Table A1.2b Monthly average NO₂ concentrations at sites in Aberdeenshire 2002, projected to 2005

<i>Monitoring Locations</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Mean</i>	2005 Estimate
Peterhead 1(Broad St)	-	-	-	-	-	-	-	-	11	18	-	-	14.5	13.3
Peterhead 2 (Queen St)	-	-	-	-	-	-	-	13	8	27	-	-	16.0	14.7
Fraserburgh 1(Saltoun Sq)	-	-	-	-	-	-	-	36	13	-	-	-	24.5	22.5
Fraserburgh 2(Kirk Brae)	-	-	-	-	-	-	-	17	28	16	-	-	20.3	18.7
Inverurie 1 (High St)	-	-	-	32	32	-	29	32	34	41	-	38	34.0	31.3
Inverurie 2 (Gordon House)	-	-	-	9	7	-	7	10	13	20	-	21	12.4	11.4
Inverurie 3 (St Andrews)	-	-	-	9	8	-	10	12	11	18	-	25	13.3	12.2
Inverurie 4 (Ury Dale)	-	-	-	7	5	-	-	10	10	17	-	18	11.2	10.3
Westhill 1 (Arnhall Cres)	-	-	-	7	7	-	8	10	14	16	-	23	12.1	11.1
Westhill 2 (Straik Rd)	-	-	-	16	-	-	18	-	23	30	-	115	40.4	37.2
Stonehaven 1 (Allardice St)	26	17	18	24	27	19	28	24	39	23	29	26	25.0	23.0
Stonehaven 2 (St Bridget Cres)	19	10	9	8	7	6	8	8	19	11	18	16	11.6	10.7
Stonehaven 3 (Hunter Dr)	17	13	8	5	8	-	8	5	37	10	17	17	13.2	12.1

Appendix 2

Detailed Traffic Flow Data

CONTENTS

Table 2.1	Road classifications in LAQM TG(03) ¹
Table 2.2	Traffic Flow Data from the NAEI Data Warehouse
Table 2.3	Traffic Flow data for local roads supplied by Aberdeenshire Council
Table 2.4	Traffic Flow Data supplied for roads under strain in Aberdeenshire

Table A2.1 Road classifications in LAQM TG(03)¹

Very busy roads	Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day.
	Dual carriageway (2 or 3-lane) roads with daily average traffic flows which exceed 120,000 vehicles per day.
	Motorways with daily average traffic flows which exceed 140,000 vehicles per day.
Busy Roads	Roads with more than 30000 vehicles per day.

Explanation of the data fields for Traffic Flow data (Table A2.2):

Rd_no	Number of the road
x	Grid reference Easting
y	Grid reference Northing
Rd_cls	Road classification
AADFYear	Year that the count was made
All_vehicles	AADF Total
CAR	AADF Cars
BUS	AADF Buses
LGV	AADF Light Goods Vehicles
HGV	AADF HGVs
HGVR	AADF HGV Rigid
HGVA	AADF HGV Articulated
MOTO	AADF Motorcycles
MB	Built-up motorway
MN	Non built-up motorway
PB	Built-up primary road
AADF	Annual Average Daily Flow

A 2.2 Traffic Flow Data from the NAEI Data Warehouse http://www.naei.org.uk/data_warehouse.php

Road	East	North	AADF Year	All vehicles	Car	Bus	LGV	HGVR	HGVA	MOTO
A90	397200	822800	2000	15027	12001	140	1607	590	570	119
A90	390000	792800	2000	18772	14407	68	1695	1016	1566	20
A98	355800	865600	2000	3946	2738	58	759	200	184	7
A90	404600	836200	2000	6544	4572	52	923	403	576	18
A90	386400	779600	2000	4084	3261	86	401	140	131	65
A93	364800	797100	2000	2973	2402	72	363	97	31	8
A93	332200	796900	2000	2102	1806	33	180	44	13	26
A97	347500	823300	2000	1295	959	19	201	65	26	25
A937	369900	768400	2000	2688	2170	40	292	106	67	13
A941	345400	828100	2000	300	230	9	41	13	1	6
A944	362700	813300	2000	3995	3336	47	393	152	45	22
A947	379900	831800	2000	4397	3546	37	461	160	168	25
A948	390000	845900	2000	817	608	10	154	25	5	15
A950	390100	853400	2000	1436	1012	22	207	123	56	16
A975	410500	837800	2000	1527	1274	51	171	25	3	3
A981	397400	862900	2000	1937	1552	43	287	45	7	3
A97	352600	839500	2000	5004	4009	105	657	176	27	30
A957	387400	785700	2000	8095	6824	208	769	170	62	62
A920	352500	840200	2000	2462	2054	23	321	38	5	21
A98	367800	864400	2000	5936	4764	55	732	258	118	9
A93	350500	798800	2000	2960	2447	70	286	103	30	24
A95	359400	858700	2000	1107	790	33	185	70	16	13
A97	341600	808600	2000	452	321	2	96	8	21	4
A939	332700	800100	2000	242	205	16	16	4	0	1
A947	373700	853600	2000	2903	2203	29	362	135	149	25
A975	399800	824900	2000	3462	3010	53	291	48	8	52
A980	369500	798000	2000	4581	3859	42	511	118	21	30
A981	394400	854300	2000	827	555	10	158	74	12	18

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Road	East	North	AADF Year	All vehicles	Car	Bus	LGV	HGVR	HGVA	MOTO
A96	351800	840000	2000	5903	4901	58	533	195	198	18
A96	380400	813200	2000	17647	14380	153	1740	695	534	145
A96	363300	834300	2000	6083	4495	60	857	272	373	26
A98	370000	864300	2000	8430	6791	180	958	314	125	62
A90	411400	840000	2000	8546	6368	118	1126	444	436	54
A952	400000	852200	2000	3844	2898	44	441	270	169	22
A93	380000	799300	2000	4305	3541	66	499	138	24	37
A93	340000	797900	2000	2460	1883	58	394	59	41	25
A97	351800	835000	2000	1947	1509	24	266	96	42	10
A98	368900	864000	2000	11049	9136	177	1278	276	156	26
A920	390000	828400	2000	2666	2129	23	284	167	43	20
A947	381800	827100	2000	9175	7231	47	1223	436	193	45
A948	393600	840000	2000	1442	1114	26	203	65	24	10
A950	395000	849200	2000	2454	1817	39	346	126	111	15
A980	360000	803400	2000	1391	1097	14	241	31	5	3
A981	388800	847000	2000	2199	1610	24	410	119	33	3
A90	396400	818200	2000	12829	10202	105	1410	392	584	136
A97	353200	839800	2000	1034	854	6	164	2	0	8
A98	368500	864200	2000	5981	4728	109	754	237	139	14
A90	381600	769900	2000	3109	2498	60	300	104	128	19
A93	357400	799900	2000	4193	3347	90	473	188	64	31
A93	321200	791500	2000	1608	1346	26	209	18	9	0
A97	363200	855000	2000	1386	993	26	262	75	22	8
A97	346100	816900	2000	830	647	10	109	38	20	6
A920	370000	832900	2000	1448	1156	4	154	75	41	18
A939	329400	808000	2000	412	347	21	37	4	0	3
A944	350000	818100	2000	1527	1098	24	293	32	38	42
A947	374800	845800	2000	4834	3585	62	722	290	156	19
A975	400000	825500	2000	4033	3548	33	345	35	36	36
A981	395900	859500	2000	1267	925	38	234	55	1	14
A90	399700	866700	2000	5896	4889	120	681	145	38	23
A96	369200	825900	2000	9334	7466	69	1106	370	284	39
A96	348500	844500	2000	6309	4965	52	814	155	298	25
A98	374500	862200	2000	2542	1892	21	394	148	79	8

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Road	East	North	AADF Year	All vehicles	Car	Bus	LGV	HGVR	HGVA	MOTO
A98	360800	863000	2000	4040	2951	55	626	249	129	30
A93	343000	797900	2000	2064	1606	53	268	77	57	3
A97	357200	842000	2000	1551	1163	22	270	62	28	6
A920	381000	827100	2000	4208	3281	74	542	221	69	21
A947	385300	823700	2000	5643	4496	50	646	219	201	31
A947	370000	863400	2000	4593	3778	42	520	157	88	8
A980	366600	800200	2000	3569	3049	27	350	93	34	16
A981	389800	848500	2000	1135	772	15	247	86	9	6
A98	369200	863700	2000	11464	9318	49	1455	385	235	22
A96	353000	839200	2000	7830	6081	91	984	370	275	29
A96	354000	839200	2000	6706	4985	66	1029	256	358	12
A96	378100	818300	2000	17575	13607	127	2413	713	614	101
A98	389500	859600	2000	2082	1435	25	420	152	48	2
A90	409800	852140	2000	4306	3408	40	600	155	89	14
A980	355500	812600	2000	620	496	4	83	27	10	0
A950	391500	851300	2000	2535	1806	15	473	161	73	7
A948	390800	844200	2000	1581	1218	14	249	60	38	2
A947	381100	827200	2000	4024	3311	22	411	122	118	40
A944	378800	808100	2000	5425	4548	59	515	193	90	20
A93	373300	796200	2000	6046	4980	101	718	143	62	42
A93	335000	797100	2000	1668	1342	37	209	50	23	7
A97	350500	828300	2000	1311	1053	27	183	25	17	6
A97	368850	864470	2000	1200	967	16	144	42	23	8
A98	399800	866960	2000	2000	1610	27	240	70	39	14
A90	393170	800230	2000	38978	31039	181	3983	1232	2392	151
A947	388980	814250	2000	22096	18932	313	1938	391	313	209
A96	382860	812325	2000	17647	14380	153	1740	695	534	145
A95	355850	855500	2000	949	672	16	193	29	37	2
A97	360890	851000	2000	1567	1207	31	210	91	28	0
A97	360370	847000	2000	1567	1207	31	210	91	28	0
A920	345000	840510	2000	849	655	15	101	29	24	25
A939	325480	810000	2000	685	608	17	48	6	0	6
A948	395700	830240	2000	5000	4132	140	542	119	43	24
A90	397250	830000	2000	4444	3473	84	672	123	59	33

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Road	East	North	AADF Year	All vehicles	Car	Bus	LGV	HGVR	HGVA	MOTO
A90	400000	833910	2000	11963	8550	95	1760	635	843	80
A948	396000	830000	2000	8920	7441	117	1038	177	23	124
A920	396000	830525	2000	5911	4805	95	747	187	31	46
A96	377560	820000	2000	12883	10533	40	1458	453	344	55
A944	330000	809250	2000	420	380	5	31	3	1	0
A97	345550	800000	2000	649	484	12	102	16	35	0
A957	380000	789310	2000	1173	874	18	184	37	39	21
A90	399750	866000	2000	5627	4526	96	756	116	56	77
A98	359000	865950	2000	5698	4437	68	824	235	124	10
A957	375000	796300	2000	3186	2550	18	445	98	53	22
A90	385940	785000	2000	20991	15572	93	1997	1142	2127	60
A90	392910	799950	2000	38978	31039	181	3983	1232	2392	151
A96	370000	825650	2000	4542	3685	24	385	247	146	55
A90	368000	768450	2000	18409	14082	62	1630	785	1803	47
A90	370300	770000	2000	15357	11331	56	1485	710	1707	68
A90	372000	770900	2000	14995	10423	47	1561	978	1928	58
A90	380000	780650	2000	16268	11898	113	1839	681	1647	90
A937	370900	770400	2000	1754	1342	48	292	32	37	3
A937	372000	771750	2000	1956	1475	46	360	50	19	6
A90	367000	767700	2000	16823	12678	63	1401	924	1695	62
A97	366300	860000	2000	1247	907	13	244	46	35	2
A90	411000	844350	2000	4249	2819	14	754	327	333	2
A90	410600	847010	2000	2614	2069	14	281	152	69	29
A982	412000	844740	2000	9255	7072	121	1383	342	273	64
A982	412000	846950	2000	6953	5543	84	867	359	56	44
A950	410000	846370	2000	5686	4625	84	669	193	85	30
A950	411000	846360	2000	7739	6641	87	695	210	50	56
A920	381000	827500	2000	6909	5494	65	792	371	170	17
A90	388500	788000	2000	25432	19542	121	2208	1179	2265	117

Table A2.3 Traffic Flow Data supplied for local roads in Aberdeenshire by Aberdeenshire Council 2002

Road	East	North	12 hr Daily flow	Annual flow	AADF 2002	AADF 2010 *
B9077	390460	802375	4738	1975091	5411	5952
A98	383335	856725	2069	862487	2363	2599
A944	373735	809525	3189	1329372	3642	4006
B9119	373365	809525	1478	616122	1688	1857
A948	394080	809525	2301	959199	2628	2891
A947	375085	809525	3914	1631597	4470	4917
B979	382755	813560	1014	422698	1158	1274
B9170	377830	822975	5674	2365274	6480	7128
A981	396720	861720	1250	521077	1428	1570
B979	385005	795225	2963	1235161	3384	3722
A950	388200	856015	2164	902089	2471	2719
A947	389050	818520	8421	3510393	9618	10579
A920	384760	826995	2868	1195560	3276	3603
A93	380845	800250	3860	1609086	4408	4849
A950	409785	846365	5626	2345264	6425	7068
B9001	373645	829055	3921	1634515	4478	4926
A92	386575	784145	4081	1701213	4661	5127
A957	375245	795635	1126	469386	1286	1415
B999	385990	831335	666	277630	761	837
A98	392470	862575	1939	808295	2215	2436
B979	381915	804825	3823	1593663	4366	4803
B977	391810	815920	3617	1507789	4131	4544

*estimated using TEMPRO growth factors

Table A2.4 Traffic Flow Data supplied for roads under strain in Aberdeenshire by Aberdeenshire Council 2002

Link	Location	2000 AADT	2001 LG AADT	2001 HG AADT	2006 LG AADT	2006 HG AADT	2011 LG AADT	2011 HG AADT	2016 LG AADT	2016 HG AADT
A90	S of Glasslaw	16757	17260	18181	18785	20293	20176	22438	21466	24599
A90	N of Stonehaven	22614	23292	24536	25350	27385	27227	30280	28968	33197
A90	Muchalls	23349	24283	26057	26431	29093	28392	32175	30213	35257
A90	S of Charleston	40282	41490	43706	45156	48781	48499	53937	51601	59134
A90	Balmedie	16500	16814	17408	18315	19437	19668	21483	20922	23546
A90	N of A975	14138	14704	15778	16005	17616	17192	19483	18295	21349
A96	Tyrebagger	17292	17983	19297	19574	21545	21026	23828	22375	26110
A96	Blackburn Bypass	16666	16983	17583	18500	19633	19866	21700	21133	23783
A96	Kintore Bypass	16581	16896	17493	18405	19532	19764	21588	21240	23661
A96	S of Thainstone	16857	17363	18290	18897	20414	20296	22572	21594	24746
A96	S of Elphinstone	22463	23136	24372	25181	27202	27045	30077	28775	32975
A96	S of Blackhall	13931	14196	14697	15464	16411	16606	18138	17665	19880
A944	E of Westhill	14401	14977	16072	16302	17944	17512	19845	18635	21746
A947	S of Newmachar	10522	10722	11101	11680	12395	12543	13700	13342	15015
A947	Urqhart Rd, Oldmeldrum	7126	7411	7953	8067	8879	8665	9820	9221	10760
A948	Station Rd, Ellon	11653	12120	13005	13192	14520	14170	16058	15079	17597
A950	E of Peripheral Road	7837	8229	9013	8958	10063	9624	11121	10243	12194
B977	Broomhill, Lyne of Skene	3425	3528	3716	3839	4147	4123	4586	4387	5028
B979	Wester Ord	3687	3798	4001	4133	4465	4439	4937	4723	5413
PETERHEAD	South Road	9017	9378	10064	10208	11236	10965	12426	11669	13616
ELLON	Bridge Street	10194	10602	11377	11540	12702	12396	14048	13191	15393
ELLON 2	South Road	11655	12121	13007	13193	14522	14172	16060	15081	17599
INVERURIE	High St	12160	12768	13984	13899	15614	14933	17255	15893	18921

Appendix 3

Emissions Data

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Table 3.1	Part A Processes in Aberdeenshire
Table 3.2	Part B Processes in Aberdeenshire

Table A3.1 Part A Processes in Aberdeenshire

SEPA Ref	Company	Site Address	Process Description
IPC/N/20020	Shell UK Ltd	St Fergus Gas Terminal, Peterhead	Refining natural gas
IPC/N/20022	International Paper	Inverurie Mills, Inverurie	Combustion
IPC/N/20007	International Paper	Inverurie Mills, Inverurie	Paper making
IPC/N/20010	Transco	Garlogie, Aberdeenshire	Combustion
IPC/N/20090	Transco	Garlogie, Aberdeenshire	Odourisation
IPC/N/20027	BP Exploration Ltd	Peterhead Power station	Natural gas refining
IPC/N/20016	BP Exploration Ltd	Oil reception facility, Cruden Bay	Petroleum
IPC/N/20003	Mobil North Sea	Sage Terminal, St Fergus	Refining natural gas
IPC/N/20012	Peterhead Harbour Trust	Dry Dock, Peterhead Harbour	Coating
IPC/N/20019	Scottish and Southern Electricity	Peterhead Power station, Boddam, Peterhead	Combustion
IPC/N/20021	Total Waste Management Alliance	Unit 12, Dales Industrial Estate, Peterhead	Recovery of oil
IPC/N/20024	TotalFinaElf	St Fergus Terminal, Peterhead	Refining natural gas
IPC/N/20011	Transco	St Fergus Terminal, Peterhead	Combustion
IPC/N/076/1993	Transco	St Fergus Terminal, Peterhead	Odourisation
	Shetland Oil Tools Ltd	Damhead Industrial Estate, Peterhead	Recovery of oil
IPC/N/20006	Fraserburgh Harbour Commissioner	Dry Dock, Inner Balaclava Harbour, Fraserburgh.	Coating

Table A3.2 Part B Processes in Aberdeenshire provided by SEPA in 2003

Operator	Location	Process Type	NGR	Section/P GN	Relevant LAQM Pollutants*	Relevant Emissions Data Available	Modelling N/Y	Authorisation/Per mit Ref APC/N/... PPC/N/...	Date of Authorisation
Dundas Brothers Ltd	Cottown Kintore Aberdeenshir e	Animal By- products rendering	NJ763 154	S6.9	None	N/A	N/A	20000	Sep-94
				PG 6/1 (00)					
McIntosh Donald	Portlethen Aberdeenshir e	Animal By- products rendering	NO920 972	S6.9	None	N/A	N/A	20241	Jun-95
				PG 6/1 (00)					
East Coast Viners Grain	Broadwood Drumlithie Stonehaven	Animal Feed Compounding	NO7951 8134	S6.9	None	N/A	N/A	20283	Mar-01
				PG 6/26 (96)					
Grampian Country Feeds Ltd	Mill of Brydock Alvah Banff	Animal Feed Compounding	NJ6536 5884	S6.9	None	N/A	N/A	20237	Nov-93
				PG 6/26 (96)					
North Eastern Farmers Ltd	Rosehall Turriff Aberdeenshir e	Animal Feed Compounding	NJ7139 4954	S6.9	None	N/A	N/A	20238	Jan-94
				PG 6/26 (96)					
Aggregate Industries Ltd	Kemnay Quarry Aquithie Rd Kemnay	Cement	NJ7380 1680	S3.1	Fugitive PM10	N/A	N/A	20263	Jun-95
				PG 3/1 (95)					
John H Connon Ltd	Harlaw Rd Inverurie	Cement	NJ7720 2230	S3.1	Fugitive PM10	N/A	N/A	20221	Mar-96
				PG 3/1 (95)					
Cebo UK Ltd	Badentoy Ind Est Portlethen	Cement	NO9098 9761	S3.1	Fugitive PM10	N/A	N/A	20281	Sep-00
				PG 3/1 (95)					
David W Gordon & Son	Elrick Skene Aberdeenshir e	Cement	NJ8221 0650	S3.1	Fugitive PM10	N/A	N/A	20069	Sep-93
				PG 3/1 (95)					

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Operator	Location	Process Type	NGR	Section/P GN	Relevant LAQM Pollutants*	Relevant Emissions Data Available	Modelling N/Y	Authorisation/Per mit Ref APC/N/... PPC/N/...	Date of Authorisation
Ennstone Thistle Ltd	Enterprise Dr Westhill Ind Est Skene	Cement	NJ831 065	S3.1	Fugitive PM10	N/A	N/A	20204	Aug-93
				PG 3/1 (95)					
Leiths (Scotland) Ltd	Lochton Quarry Slug Rd Durris Aberdeenshir e	Cement	NO752 927	S3.1	Fugitive PM10	N/A	N/A	20296	Mar-96
				PG 3/1 (95)					
Lovie Ltd	Howe of Byth Quarry New Byth Turriff	Cement	NJ8414 5725	S3.1	Fugitive PM10	N/A	N/A	20225	Sep-93
				PG 3/1 (95)					
Aggregate Industries Ltd	Faichfield Longside Peterhead	Cement	NK063 467	S3.1	Fugitive PM10	N/A	N/A	20171	Sep-93
				PG 3/1 (95)					
Cebo UK Ltd	Asco Ltd South Bay Marine Base Peterhead	Cement	NK128 448	S3.1	Fugitive PM10	N/A	N/A	20251	Sep-93
				PG 3/1 (95)					
Halliburton Manufacture	Asco Ltd South Bay Marine Base Peterhead	Cement	NK128 448	S3.1	Fugitive PM10	N/A	N/A	20252	Sep-93
				PG 3/1 (95)					
Kirkmyres Sand & Gravel	Pitnacalder Quarry New Aberdour Fraserburgh	Cement	NJ874 624	S3.1	Fugitive PM10	N/A	N/A	20155	Mar-96
				PG 3/1 (95)					
Lovie Ltd	Cowbog New Pitsligo Fraserburgh	Cement	NJ8471 5699	S3.1	Fugitive PM10	N/A	N/A	20173	Sep-93
				PG 3/1 (95)					
Lovie Ltd	Blackhills Quarry Tyrie Fraserburgh	Cement	NJ9262 6060	S3.1	Fugitive PM10	N/A	N/A	20172	Sep-93
				PG 3/1 (95)					

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Watermill Aggregates Ltd	Broomhead Quarry Fraserburgh	Cement	NJ985 638	S3.1	Fugitive PM10	N/A	N/A	20154	Nov-93
				PG 3/1 (95)					
Bridgend Sand and Gravel	Mill of Balmaud King Edward Banff	Cement mobile plant	N/A	S3.1	Fugitive PM10	N/A	N/A	20294	Jan-01
				PG 3/1 (95)					
Aggregate Industries Ltd	Toms Forest Quarry Kintore	Cement/ Crushing plant (quarry)	NJ764 168	S3.1/3.4	Fugitive PM10	N/A	N/A	20229	May-95
				PG 3/1 (95)					
				PG 3/8 (96)					
Aberdeenshire Council	Balmedie Quarry Balmedie Aberdeenshir e	Crushing plant (quarry)	NJ946 178	S3.4	Fugitive PM10	N/A	N/A	20123	Sep-93
				PG 3/8 (96)					
Aberdeenshire Council	Pitcaple Quarry Pitcaple Inverurie	Crushing plant (quarry)	NJ729 264	S3.4	Fugitive PM10	N/A	N/A	20124	Sep-93
				PG 3/8 (96)					
Aberdeenshire Council	Craiglash Quarry Glassel Banchory	Crushing plant (quarry)	NJ621 988	S3.4	Fugitive PM10	N/A	N/A	20223	Jul-94
				PG 3/8 (96)					
Les Taylor Group	North Mains Quarry Findon Portlethen	Crushing plant (quarry)	NJ944 988	S3.4	Fugitive PM10	N/A	N/A	20227	Apr-94
				PG 3/8 (96)					
Ready Mix Concrete Ltd	Thorp Park Quarry South Deeside Rd Durriss	Crushing plant (quarry)	NO804 979	S3.4	Fugitive PM10	N/A	N/A	20192	Jul-94
				PG 3/8 (96)					

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Thistle Aggregates Ltd	Craigenlow Quarry Dunecht Aberdeenshir e	Crushing plant (quarry)	NJ732 094	S3.4	Fugitive PM10	N/A	N/A	20210	Sep-93
				PG 3/8 (96)					
Boyne Bay Lime Co Ltd	Boyne Bay Quarry Boyndie Portsoy	Crushing plant (quarry)	NJ6145 6533	S3.4	Fugitive PM10	N/A	N/A	20302	Jan-94
				PG 3/8 (96)					
CA Duguid & Sons	Knapps of Thernie Quarry Auchterless Turriff	Crushing plant (quarry)	NJ737 444	S3.4	Fugitive PM10	N/A	N/A	20222	Jan-94
				PG 3/8 (96)					
Ennstone Thistle Ltd	Blackhills Quarry Longhaven Peterhead	Crushing plant (quarry)	NK116 397	S3.4	Fugitive PM10	N/A	N/A	20248	Dec-93
				PG 3/8 (96)					
Ennstone Thistle Ltd	Stirlinghill Quarry Boddam Peterhead	Crushing plant (quarry)	NK1204 4178	S3.4	Fugitive PM10	N/A	N/A	20092	Mar-99
				PG 3/8 (96)					
Les Taylor Contractors	Savoch Quarry Longside Peterhead	Crushing plant (quarry)	NK064 426	S3.4	Fugitive PM10	N/A	N/A	20214	Dec-93
				PG 3/8 (96)					
Lovie Ltd	Cottonhill Quarry Macduff	Crushing plant (quarry)	NJ724 639	S3.4	Fugitive PM10	N/A	N/A	20228	Sep-94
				PG 3/8 (96)					
Les Taylor contractors	Longside Rd Mintlaw	Mobile crushing plant	N/A	S3.4	Fugitive PM10	N/A	N/A	20034	Jun-98
				PG 3/16 (96)					
Bridgend Sand and Gravel	Mill of Balmaud King Edward Banff	Mobile crushing plant	N/A	S3.4	Fugitive PM10	N/A	N/A	20220010	Jul-02

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				PG 3/16 (96)					
McIntosh Plant Hire	Birchmoss Storage Depot Echt Westhill	Mobile crushing plant	N/A	S3.4	Fugitive PM10	N/A	N/A	20289	Sep-00
				PG 3/16 (96)					
Chap Quarries (Aberdeen)	Enterprise Dr Westhill	Mobile crushing plant	N/A	S3.4	Fugitive PM10	N/A	N/A	20178	Jun-99
				PG 3/16 (96)					
Aggregate Industries Ltd	Toms Forest Quarry Kintore	Mobile crushing plant	N/A	S3.4	Fugitive PM10	N/A	N/A	220014	Jul-02
				PG 3/16 (96)					
Alan Whiteford Contracts Ltd	Moulandale Burnhervie Inverurie	Mobile crushing	N/A	S3.4	Fugitive PM10	N/A	N/A	20288	Feb-01
				PG 3/16 (96)					
Tuboscope (UK) Ltd	Badentoy Ind Est Portlethen	Metal decontaminati on	NO909 977	S2.1	None	N/A	N/A	20176	Mar-96
				PG 2/9 (96)					
James Cordiner & Son	Silverbank Sawmills Banchory	Timber	NO7135 9620	S6.7	None	N/A	N/A	20087	Jul-93
				PG 6/2 (95)					
James Jones & Sons Ltd	Burnfoot Sawmill Dinnet Aboyne	Timber	NO485 980	S6.7	None	N/A	N/A	20137	May-93
				PG 6/2 (95)					
Stewart Milne Timber Systems	Westhill Ind Est Westhill	Timber	NJ824 064	S6.7	None	N/A	N/A	20199	Mar-95
				PG 6/2 (95)					
RB Farquhar (Manufacturin g) Ltd	Deveronside Works Huntly	Timber	NJ5235 3955	S6.7	None	N/A	N/A	20135	Jul-93
				PG 6/2 (95)					
Riddochs Ltd	Kinnoir Sawmill Huntly	Timber	NJ5597 4373	S6.7	None	N/A	N/A	20076	May-93
				PG 6/2 (95)					

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BP Express Shopping Ltd	Stevensons Service Station Elphinstone Rd Inverurie	PVR*	NJ778 198	S1.4	Fugitive benzene	N/A	N/A	20153	Feb-99
				PG 1/14 (96)					
ESSO Petroleum Co Ltd	Inverurie Service Station North Street Inverurie	PVR	NJ765 224	S1.4	Fugitive benzene	N/A	N/A	20108	Feb-99
				PG 1/14 (96)					
K&A Anderson	Lonenwell Garage Alford Aberdeenshir e	PVR	NJ5925 1592	S1.4	Fugitive benzene	N/A	N/A	20304	Sep-01
				PG 1/14 (96)					
Meldrum Motors	Spring Garden Filling Station Oldmeldrum	PVR	NJ8112 2763	S1.4	Fugitive benzene	N/A	N/A	20309	Dec-01
				PG 1/14 (96)					
Safeway Stores plc	Blackhall Rd Inverurie	PVR	NJ762 217	S1.4	Fugitive benzene	N/A	N/A	20083	Dec-98
				PG 1/14 (96)					
Stuart Joss Houghton Garage Ltd	Mont Garrie Rd Alford	PVR	NJ5763 1612	S1.4	Fugitive benzene	N/A	N/A	20313	Dec-01
				PG 1/14 (96)					
Tesco Stores Ltd	Tesco PFS Harlaw Rd Inverurie	PVR	NJ7732 2189	S1.4	Fugitive benzene	N/A	N/A	20298	Mar-01
				PG 1/14 (96)					
Aboyne Filling Station	Main Rd Aboyne	PVR	NJ537 535	S1.4	Fugitive benzene	N/A	N/A	20118	Jan-99
				PG 1/14 (96)					
Alan & Patrice Robertson	Stone Mill Inn Filling Station Dunottar Ave Stonehaven	PVR	NO873 856	S1.4	Fugitive benzene	N/A	N/A	20175	Apr-99
				PG 1/14 (96)					

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Alldays Stores Ltd	Kirkton Rd Stonehaven	PVR	NO864 860	S1.4	Fugitive benzene	N/A	N/A	20197	Jun-99
				PG 1/14 (96)					
Asda Stores Ltd	Asda Portlethen PFS Muirend Rd Portlethen	PVR	NJ920 975	S1.4	Fugitive benzene	N/A	N/A	20059	Sep-98
				PG 1/14 (96)					
Braemar Service Station	Ballater Rd Braemar	PVR	NO153 918	S1.4	Fugitive benzene	N/A	N/A	20315	Mar-02
				PG 1/14 (96)					
Dunecht Garage Ltd	The Garage Dunecht Westhill	PVR	NJ753 091	S1.4	Fugitive benzene	N/A	N/A	20306	Dec-01
				PG 1/14 (96)					
ESSO Petroleum Co Ltd	New Hillside Service Station Hillside Portlethen	PVR	NJ923 976	S1.4	Fugitive benzene	N/A	N/A	20134	Feb-99
				PG 1/14 (96)					
Gleaner Oils Ltd	Tor na Coille Filling Station Banchory	PVR	NJ684 962	S1.4	Fugitive benzene	N/A	N/A	20066	Apr-99
				PG 1/14 (96)					
Olympia Garage	Banchory Aberdeenshir e	PVR	NJ715 964	S1.4	Fugitive benzene	N/A	N/A	20035	Dec 1998 to be revoked Apr 2003
				PG 1/14 (96)					
Osprey Forecourts Ltd	Newtonhill Filling Station Newtonhill	PVR	NO935 936	S1.4	Fugitive benzene	N/A	N/A	20037	Dec-98
				PG 1/14 (96)					
Riverside Garage	Tullich Rd Ballater	PVR	NO373 959	S1.4	Fugitive benzene	N/A	N/A	20311	Feb-02
				PG 1/14 (96)					
Robert F Simpson	Westhill Service Station Elrick Westhill	PVR	NJ825 067	S1.4	Fugitive benzene	N/A	N/A	20052	Oct-98
				PG 1/14 (96)					

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Safeway Stores plc	Safeway Petrol Station North Deeside Rd Banchory	PVR	NO711 961	S1.4	Fugitive benzene	N/A	N/A	20122	Mar-99
				PG 1/14 (96)					
Alastair Scott	Central Filling Station Fife Street Turriff	PVR	NJ7258 5001	S1.4	Fugitive benzene	N/A	N/A	20138	Feb-99
				PG 1/14 (96)					
Ashgrove Filling Station	Cairnie Huntly	PVR	NJ4870 4413	S1.4	Fugitive benzene	N/A	N/A	22022002	Feb-02
				PG 1/14 (96)					
North East Projects Ltd	Turriff Service Station Station Rd Turriff	PVR	NJ7246 4931	S1.4	Fugitive benzene	N/A	N/A	20136	Mar-99
				PG 1/14 (96)					
Octo Petroleum Ltd	Strathbogie Service Station Aberdeen Rd Huntly	PVR	NJ5415 3921	S1.4	Fugitive benzene	N/A	N/A	20040	Nov-98
				PG 1/14 (96)					
Portsoy Motors	Seafield Terr Portsoy	PVR	NJ0000 0000	S1.4	Fugitive benzene	N/A	N/A	20314	Feb-02
				PG 1/14 (96)					
Aberness Foods Ltd	Northgate Filling Station Balmoor Terr Peterhead	PVR	NK1205 4607	S1.4	Fugitive benzene	N/A	N/A	20146	Apr-99
				PG 1/14 (96)					
Aberness Foods Ltd	Barbours Garage 45 Cross Street Fraserburgh	PVR	NJ997 669	S1.4	Fugitive benzene	N/A	N/A	20058	Dec-98
				PG 1/14 (96)					
Belmont Vauxhall	Victoria Street Fraserburgh	PVR	NJ997 666	S1.4	Fugitive benzene	N/A	N/A	20151	May-99
				PG 1/14 (96)					

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BP Express Shopping Ltd	Ythan Service Station Station Road Ellon	PVR	NJ9541 3051	S1.4	Fugitive benzene	N/A	N/A	20045	May-99
				PG 1/14 (96)					
Co-op Wholesale Society Ltd	Longside Rd Copland Hill Peterhead	PVR	NK110 464	S1.4	Fugitive benzene	N/A	N/A	20168	Jun-99
				PG 1/14 (96)					
John A Smith & Sons	12 Seagate Peterhead	PVR	NK137 461	S1.4	Fugitive benzene	N/A	N/A	20164	Jun-99
				PG 1/14 (96)					
Kessock Service Station Ltd	South Road Fraserburgh	PVR	NJ997 656	S1.4	Fugitive benzene	N/A	N/A	20202	Dec-99
				PG 1/14 (96)					
Kessock Service Station Ltd	Watermill Service Station Banff Rd Fraserburgh	PVR	NJ987 668	S1.4	Fugitive benzene	N/A	N/A	20111	Mar-99
				PG 1/14 (96)					
Macduff Motors Ltd	Victoria Filling Station Boydie Rd Banff	PVR	NJ6809 6435	S1.4	Fugitive benzene	N/A	N/A	20130	Mar-99
				PG 1/14 (96)					
Matrix (Highlands) Ltd	Mintlaw Service Station The Square Mintlaw Peterhead	PVR	NK001 483	S1.4	Fugitive benzene	N/A	N/A	20174	May-99
				PG 1/14 (96)					
Peterhead Motors Ltd	South Road Peterhead	PVR	NK125 457	S1.4	Fugitive benzene	N/A	N/A	20056	Sep-98
				PG 1/14 (96)					
Regency Oils Ltd	Regency Filling Station South Rd Ellon	PVR	NJ9595 3005	S1.4	Fugitive benzene	N/A	N/A	20305	Sep-01
				PG 1/14 (96)					

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Safeway Stores Ltd	Safeway PFS Queen	PVR	NJ1275 4674	S1.4	Fugitive benzene	N/A	N/A	20023	Apr-98
				PG 1/14 (96)					
Ugie Motors	Fraserburgh Rd Strichen	PVR	NJ9438 5548	S1.4	Fugitive benzene	N/A	N/A	20310	Dec-01
				PG 1/14 (96)					
Union Road Filling Station	18 Union Rd Macduff	PVR	NJ699 643	S1.4	Fugitive benzene	N/A	N/A	20165	May-99
				PG 1/14 (96)					
William J Coull	Drum of Wattle Inverurie	PVR	NJ7292 3161	S1.4	Fugitive benzene	N/A	N/A	20312	Dec-01
				PG 1/14 (96)					
Gray & Adams Ltd	South Road Fraserburgh	Vehicle respraying	NJ7670 2260	S6.5	None	N/A	N/A	20201	Apr-94
				PG 6/34 (97)					
John A Stephen (Paintshop) Ltd	Unit 9 Blackhouse Ind Est Peterhead	Vehicle respraying	NK115 471	S6.5	None	N/A	N/A	20213	May-94
				PG 6/34 (97)					
Aberdeenshire Council	Harlaw Repair Depot Harlaw Rd Inverurie	Vehicle respraying	NJ7670 2260	S6.5	None	N/A	N/A	20250	Feb-96
				PG 6/34 (97)					
Inverurie Autobody	Units 1&3 Harlaw Business Centre Inverurie	Vehicle respraying	NJ767 227	S6.5	None	N/A	N/A	20194	Oct-95
				PG 6/34 (97)					
Kinghorn Bodyshop	Blackburn Business Park Aberdeen	Vehicle respraying	NJ8220 1250	S6.5	None	N/A	N/A	220023	Oct-03
				PG 6/34 (97)					
Lawrence of Kemnay	Elphinstone Rd Inverurie	Vehicle respraying	NJ7780 1975	S6.5	None	N/A	N/A	220015	Jun-02
				PG 6/34 (97)					
Lawrence of Kemnay	Aquithie Rd Kemnay	Vehicle respraying	NJ742 173	S6.5	None	N/A	N/A	20240	Aug 1995 (to be revoked Mar 03)

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				PG 6/34 (97)					
Gordon Donald	Blackburn Garage Blackburn Aberdeen	Waste Oil Burner	NJ8315 1240	S1.3	None	N/A	N/A	20073	Dec-93
				PG 1/1 (95)					
K&A Anderson	Lonenwell Garage Alford	Waste Oil Burner	NJ5923 1596	S1.3	None	N/A	N/A	20074	Dec-93
				PG 1/1 (95)					
Leylodge Motors	Kintore Aberdeenshir e	Waste Oil Burner	NJ7713 1416	S1.3	None	N/A	N/A	20013	Jan-97
				PG 1/1 (95)					
Stanley Clark Ltd	Beechbank Kemnay	Waste Oil Burner	NJ7258 1519	S1.3	None	N/A	N/A	20285	Jul-00
				PG 1/1 (95)					
Coull Cars	Monzie Hillside Portlethen	Waste Oil Burner	NO925 98	S1.3	None	N/A	N/A	20190	Jan-95
				PG 1/1 (95)					
Crathes Garage	Crathes Banchory	Waste Oil Burner	NO7506 9635	S1.3	None	N/A	N/A	20025/97	Jan-95
				PG 1/1 (95)					
Framor	The Garage Tillybrake Rd Banchory	Waste Oil Burner	NO7170 9635	S1.3	None	N/A	N/A	20220	Jan-95
				PG 1/1 (95)					
Ian Blake Cars	Church Street Garage Inverbervie	Waste Oil Burner	NO828 727	S1.3	None	N/A	N/A	20191	Jan-95
				PG 1/1 (95)					
George Beaton	Riverside Garage Tullich Rd Ballater	Waste Oil Burner	NJ372 958	S1.3	None	N/A	N/A	20264	Mar-00
				PG 1/1 (95)					
Peter Thornton	Thornton Garage Fordoun by Laurencekirk	Waste Oil Burner	NO745 775	S1.3	None	N/A	N/A	20141	Dec-98
				PG 1/1 (95)					

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McIntosh Plant Hire (Abdn) Ltd	Birchmoss Plant & Storage Depot Echt Westhill	Waste Oil Burner	NJ747 027	S1.3	None	N/A	N/A	20067	Aug-98
				PG 1/1 (95)					
William Walker Transport	Southview Persley Aberdeen	Waste Oil Burner	NJ908 097	S1.3	None	N/A	N/A	20160	Mar-95
				PG 1/1 (95)					
Argyll Garage	Chapel Street Huntly	Waste Oil Burner	NJ5277 4009	S1.3	None	N/A	N/A	20077	Dec-93
				PG 1/1 (95)					
Morrison Motors	Green Gates Banff Rd Turriff	Waste Oil Burner	NJ734 506	S1.3	None	N/A	N/A	20139	Sep-93
				PG 1/1 (95)					
R&V McLaren	The Garage 127 Main Street Aberchirder Huntly	Waste Oil Burner	NJ625 525	S1.3	None	N/A	N/A	20239	Sep-93
				PG 1/1 (95)					
Alexander Clark	The Garage St Katherines Inverurie	Waste Oil Burner	NJ784 344	S1.3	None	N/A	N/A	20078	Sep-93
				PG 1/1 (95)					
NJ &WJ Smith	Central Garage 58 Main Street Longside	Waste Oil Burner	NK034 4765	S1.3	None	N/A	N/A	20079	Sep-93
				PG 1/1 (95)					
P&F Mitchell	Mitchell's Garage Pitmedden Ellon	Waste Oil Burner	NJ893 273	S1.3	None	N/A	N/A	20107	Mar-95
				PG 1/1 (95)					
JMS Coatings Ltd	Unit 8/9 Harlaw Business Centre	Coating of metal and plastic	NJ767 227	S6.5	None	N/A	N/A	20203	Aug-94
				PG 6/23 (97)					

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Easyblast Ltd	Tumulus Way Midmill Ind Est Kintore	Coating of metal and plastic	NJ7935 1490	S6.5	None	N/A	N/A	220018	Oct-02
				PG 6/23 (97)					
Elmar Services	Enterprise Dr Westhill Aberdeenshir e	Coating of metal and plastic	NJ8258 0637	S6.5	None	N/A	N/A	20280	Sep-00
				PG 6/23 (97)					
Gemini Corrosion Services LTF	Broomhill Rd Spurryhillock Ind Est Stonehaven	Coating of metal and plastic	NJ9110 9744	S6.5	None	N/A	N/A	20233	Mar-96
				PG 6/23 (97)					
Ramco Tubular Services Ltd	Badentoy Ind Est Portlethen	Coating of metal and plastic	NJ9098 9751	S6.5	None	N/A	N/A	20275	Mar-96
				PG 6/23 (97)					
Tuboscope (UK) Ltd	Badentoy Ind Est Porlethen	Coating of metal and plastic	NJ947 038	S6.5	None	N/A	N/A	20206	Jul-95
				PG 6/23 (97)					
Bredero Price Coaters Ltd	Castle Park Ind Est Ellon	Coating of metal and plastic	NJ969 307	S6.5	None	N/A	N/A	20180	Dec-93
				PG 6/23 (97)					
Gray and Adams	South Rd Fraserburgh	Coating of metal and plastic	NJ997 656	S6.5	None	N/A	N/A	20185	Jun-99
				PG 6/23 (97)					
Fraser Manufacturing Ltd	Rothienorma n Inverurie	Coating of metal and plastic	NJ723 357	S6.5	None	N/A	N/A	20212	Apr-95
				PG 6/23 (97)					
Pelikan Hardcopy Scotland Ltd	Markethill Rd Turriff	Manufacture of Printing Ink	NJ7285 5033	S6.6	None	N/A	N/A	20042	Jun-94
				PG 6/11(97)					
Bredero Price Coaters	Castle Park Ind Est Ellon	Di-isocyanate	NJ969 307	S6.2	None	N/A	N/A	20179	Dec-93
				PG 6/29 (97)					

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Gray and Adams	South Rd Fraserburgh	Di-isocyanate	NJ9976 6586	S6.2	None	N/A	N/A	20300	Mar-01
				PG 6/29 (97)					
Gray and Adams	South Rd Fraserburgh	Di-isocyanate	NJ9976 6586	S6.2	None	N/A	N/A	20181	Apr-94
				PG 6/29 (97)					
British Gas Transco	Kinknockie Nr Newton Aberdeenshir e	Gas odorisation	Withheld	S1.1	None	N/A	N/A	20038	Mar-98
				PG 1/15 (97)					
Precision Powertrain 9UK) Ltd	Catto Dr Peterhead	Waste Oil Burner	N/A	S1.1	None	N/A	N/A	30007	Application received 06/12/02
				PG 1/2 (95)					

Appendix 4

Descriptions of selected models and tools

CONTENTS

Design Manual for Roads and Bridges (DMRB)⁶

Simple screening models¹^a

Design Manual for Roads and Bridges (DMRB) - This screening method was formulated by the Highways Agency. The method gives a preliminary indication of air quality near roads. It is a simple procedure based on a tabulated input interface, which produces an estimate of concentrations at receptor locations defined by the user.

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. All the relevant AQS pollutants can be estimated.

More details of the model can be found at:

<http://www.highways.gov.uk/contracts/index.htm>

^a The information on simple screening models has been taken from LAQM.TG(03) Review and Assessment: *Selection and use of dispersion models*.