Report

Air Quality Updating and Screening Assessment Report for Fife Council - 2006

A Report Produced for Fife Council

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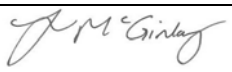
Reviewed by	J McGinlay		26/07/2006
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Executive Summary

This Air Quality Updating and Screening Report has been prepared for Fife Council as part of the Local Air Quality Management (LAQM) system introduced in Part IV of the Environment Act 1995. Published guidance from the Scottish Executive has been closely followed in the preparation of this report.

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

The third round of review and assessment is to be undertaken in two steps, essentially following the format of the second round. The first step is an Updating and Screening Assessment, which updates the findings of the previous Review and Assessment cycle, undertaken for all pollutants identified in the Air Quality Regulations. Where a significant risk of exceedence is identified for a pollutant it will be necessary for the Local Authority to proceed to a Detailed Assessment the following year. Where a Local Authority does not need to undertake a Detailed Assessment, a progress report is required instead.

This Updating and Screening Assessment has concluded that Fife Council is not required to carry out a Detailed Assessment for any of the pollutants assessed.

However, it is recommended that monitoring of nitrogen dioxide and particles (PM_{10}) continues at Bonnygate, Cupar and recommences at Admiralty Road, Rosyth, to better assess concentrations of these pollutants.

Contents

Appendices

1 Introduction

This Air Quality Updating and Screening Report has been prepared for Fife Council to comply with the Local Air Quality Management (LAQM) system introduced in Part IV of the Environment Act 1995.

1.1 PURPOSE OF THE UPDATING AND SCREENING ASSESSMENT REPORT

The second round of air quality review and assessments is now complete. Where Local Authorities identified the likelihood of exceedences of air quality objectives in areas of significant public exposure, an air quality management area will have been declared, followed by a Further Assessment, and the formulation of an Action Plan detailing measures intended to reduce or to eliminate exceedences. For Fife Council, the second round of Review and Assessment did not identify any areas of likely exceedence and hence, no further action was required.

Local authorities are now required to proceed to the third round of review and assessment. The updating and screening assessment reassesses sources of emissions to air to identify whether the situation has changed since the second round of review and assessment. Changes are reviewed to assess the potential impact on predicted exceedences of the air quality objectives. Such changes might include significant traffic growth on a major road, which had not been foreseen, construction of a new industrial plant with emissions to air, or significant changes in the emissions of an existing plant.

The third round of review and assessment is to be undertaken in two steps. The first step is an Updating and Screening Assessment. This Assessment updates the findings of the previous Review and Assessment cycle, undertaken for all pollutants identified in the Air Quality Regulations. Where a significant risk of exceedence is identified for a pollutant it will be necessary for the local authority to proceed to a Detailed Assessment. Where a local authority does not need to undertake a Detailed Assessment, a progress report is required instead by the following year.

1.2 STRUCTURE OF THE REPORT

The report is structured as follows:

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

1.3 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 and second rounds of review and assessment;
- Identify any sources for which emissions have changed significantly since the last round of review and assessment;
- Identify and interpret the significance of air quality monitoring data made available since the last round of review and assessment;
- Assess the risk of exceedences of the air quality objectives in locations where relative public exposure may exist using screening models and nomograms; and
- Where necessary, identify locations and pollutants for which further detailed assessment of air quality will be required.

1.4 RELEVANT GUIDANCE DOCUMENTATION

The report conforms to the Scottish Executive Revised Policy Guidance Paper[1] 2003/2, the Technical Guidance, LAQM TG(03)[2] and subsequent updates provided through the Helpdesk Frequently Asked Questions system. Chapter checklists conform to the latest versions issued in January 2006. Fife Council and the author of this report have had due regard to the relevant guidance.

This report builds on previous review and assessment work and, in particular the 2003 Updating and Screening Report[3], the 2004 Progress Report[4] and the 2005 Progress Report[5].

1.5 AIR QUALITY STRATEGY OBJECTIVES

The Air Quality Strategy Objectives are shown in Table 1.1. No new objectives have been introduced since the previous Updating and Screening Report in 2003. The table shows the standards in $\mu g\ m^{-3}$ ($mg\ m^{-3}$ for CO) with the number of exceedences that are permitted (where applicable).

Table 1.1 Objectives included in the Air Quality Regulations and subsequent Amendments 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	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		maximum daily running 8-hour mean	31.12.2003
Authorities in England, Wales and Northern Ireland only	10.0 mg m^{-3}		
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[a]	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 (PM_{10}) (gravimetric)[b] 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[c]	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. These objectives are provisional.
b. Measured using the European gravimetric transfer sampler or equivalent.
c. These 2010 Air Quality Objectives for PM_{10} apply in Scotland only, as set out in the Air Quality (Scotland) Amendment Regulations 2002.

In Scotland, the PM10 objective for 2010 has been adopted into regulation and hence, assessment against this objective is required. However, in England, Wales and Greater London the 2010 objectives for PM10 are not currently included in Regulations for the purpose of LAQM.

2 The UK Air Quality Strategy

2.1 NATIONAL AIR QUALITY STANDARDS

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in January 2000 with an addendum issued in February 2003. The Air Quality Strategy provides national air quality standards and objectives which have a specific timescales for the achievement. The air quality objectives for Scotland have been set in a series of Air Quality Regulations (Scotland). The objectives are to be achieved between 2003 and 2010 and are shown in Table 1.1.

2.2 AIR QUALITY REVIEWS – THE APPROACHES AND EXPECTED OUTCOMES

Technical Guidance has been issued in 'Review and Assessment: Technical Guidance' LAQM.TG (03)[2] to enable air quality to be monitored, modelled, reviewed and assessed in an appropriate and consistent fashion. This updating and screening assessment has considered the procedures set out in this technical guidance.

The primary objective of undertaking a review of air quality is to identify any areas that are unlikely to meet 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 Table 2.1.

Table 2.1 Brief details of steps in the third 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 exceedence 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 of the progress report is left up to the local authority to decide, but guidance on what it should cover is available in the Policy Guidance documents[1], published in 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 April 2006, and for detailed assessments April 2007.

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 *should* apply at …	Objectives should *not* generally apply at …
Annual mean	• 1,3 Butadiene • Benzene • Lead • Nitrogen dioxide • Particulate Matter (PM_{10})	All background locations where members of the public might be regularly exposed.	Building facades of offices or other places of work where members of the public do not have regular access.
		Building facades of residential properties, schools, hospitals, libraries etc.	Gardens of residential properties.
			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	• Carbon monoxide • Particulate Matter (PM_{10}) • Sulphur dioxide	All locations where the annual mean objective would apply.	Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term.
		Gardens of residential properties.	
1 hour mean	• Nitrogen dioxide • Sulphur dioxide	All locations where the annual mean and 24 and 8-hour mean objectives apply.	Kerbside sites where the public would not be expected to have regular access.
		Kerbside sites (e.g. pavements of busy shopping streets).	
		Those parts of car parks and railway stations etc. which are not fully enclosed.	
		Any outdoor locations to which the public might reasonably be expected to have access.	
15 minute mean	• Sulphur dioxide	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

It is not necessary to consider exceedences of the objectives at any location where public exposure over the relevant averaging period would be unrealistic. Locations should also represent non-occupational exposure.

3 Information used to support this assessment

3.1 THE FIRST AND SECOND ROUNDS OF REVIEW AND ASSESSMENT OF AIR QUALITY FOR FIFE COUNCIL

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

- Stage 1 (1998),
- Stage 2 (2001)
- Updating and Screening Assessment[3] (January 2003) and Annual Progress Reports[4,5] in 2004 and 2005

The previous assessments of the air quality in Fife concluded that there were unlikely to be any exceedences of the Air Quality Objectives for any of the pollutants covered by the Strategy.

3.2 PROPOSED DEVELOPMENTS WHICH MAY AFFECT AIR QUALITY

Any new developments in the local authority or in surrounding areas that may impact on local air quality need to be considered.

3.2.1 Industry

SEPA have all provided the relevant information on industrial premises in Fife and this has been included in the Chapters for the individual pollutants as appropriate

3.2.2 Housing and redevelopment

Residential

The East Dunfermline Expansion Area, which includes most of the land between Dunfermline and the M90, is identified as the main focus for growth over the next 10 to 15 years. When complete, more than 4,000 houses, 131 hectares of employment land and a commercial leisure park will be linked by an integrated transport network. At its heart is the Duloch Park District Centre which already incorporates the Tesco superstore adjacent to the new District Park. Schools and other community facilities will complement a high quality environment, including the protected Calais Muir Wood.

Other large housing sites identified in the Plan are at Bellyeoman and Sheephousewell to the north east of the Town and at Pitreavie Castle to the south.

The Fife Structure Plan[10] envisages the population of Dunfermline growing to over 50,000 over the next 20 years, with over 4550 new houses to the South West, West and North of the city.

This development and the commercial development discussed in Section 3.2.3 may impact on traffic volumes in East Dunfermline in the future. However, in the Council's view, the current NO_2 monitoring locations in Dunfermline will suitably assess any air quality issues arising and the impact of the development will be considered in future reports, as appropriate.

In addition, Fife Council are currently considering options for residential and commercial development and associated transport issues in Cupar. Following local stakeholder consultation, an option is being considered to develop additional housing together with a town centre relief road to the north of the town. It is anticipated that the relief road and associated traffic calming measures

on the existing town centre roads would eliminate much of the through traffic from the town centre and hence, considerably reduce the traffic in Bonnygate in Cupar. This will be particularly relevant to nitrogen dioxide concentrations in Bonnygate, as discussed in Chapter 8.

3.2.3 Commercial Development

Employment land is concentrated at the eastern and southern approaches to Dunfermline, with major sites at Calais Muir, Dover Heights, Pitreavie and Halbeath. The Plan retains a commitment to the completion of Motorola's microprocessor development at East Dunfermline

3.2.4 Transport

Fife's Local Transport Strategy (LTS) is currently undergoing revision. There is nothing in the draft of the revised LTS which will adversely impact air quality in Fife. There is significant emphasis in the new document on accessibility, use of more sustainable methods of travel and travel planning.

Transportation Services' Transportation Development Guidelines is also undergoing significant revision at present. New sections in this document include chapters on Maximum Parking Standards (applicable to all developments other than residential properties) and Travel Planning, both of which advocate use of more sustainable forms of travel to developments, which should have a positive impact on air quality.

Outline transport proposals given in the recently published Fife Structure Plan are reproduced in Appendix 5.

3.2.5 Assessment of New Road Developments

During 2004, the Kincardine Eastern Link Road was opened. In addition, a new section of the A981 at Chapel Level, Kirkcaldy has been developed. Both of these roads have been included in the assessments in the relevant sections of this report.

3.2.6 Trains

No new locations have been identified where trains are stationary with engines running for more than 15 mins.

Scotrail has specific instructions related to diesel locomotive emissions. There is a "no idling policy" whereby, if the driver is informed by the signaller that the train is to remain stationary for more than 15 minutes the locomotive engine shall be shut down. The signaller will then phone the driver 5 minutes prior to the departure time so the driver can restart the locomotive. In addition, ScotRail's DMU fleet is designed to save fuel by closing down engines automatically if they are idling for more than fifteen minutes

It is also ScotRail's policy (Engineering Document MP/DMU/SC/0017) to test the exhaust emissions of all its DMU fleet on an annual basis to ensure engine efficiency (using a Sun ASA 200 Diesel Engine Exhaust Emission Test Unit). Records of any work done and emission test results are formally retained for each vehicle. All new or reconditioned engines being purchased by ScotRail shall comply with the emission test. Every opportunity is taken to remove any non-compliant engine from the supply line.

No other train operator (i.e. Virgin, GNER) have engines stationary for 15 mins, within Fife.

3.2.7 Airports

There are no significant changes to report since the last Updating and Screening Assessment report of August 2003 and the 2004 and 2005 Progress Reports.

3.2.8 Bus Stations

There are no significant changes to report since the last Updating and Screening Assessment report of August 2003 and the 2004 and 2005 Progress Reports.

3.2.9 Shipping

There are no significant changes to report since the last Updating and Screening Assessment report of August 2003 and the Progress Report of July 2004.

3.2.10 Petrol Stations on Busy Roads

The Updating and Screening assessment concluded that there are no sections of major roads in Fife that 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. This remains the case.

3.3 AIR QUALITY MONITORING

New data are available for the following pollutants:

- Carbon Monoxide (CO),
- Benzene;
- 1,3-butadiene;
- Nitrogen dioxide (NO_2);
- Sulphur Dioxide (SO_2);
- PM_{10}.

Data for 2005 are available from the automatic monitoring sites operated by Fife Council at Kincardine and Rosyth (see 3.3.1) and for the NO_2 diffusion tubes operated throughout Fife (see 3.3.2).

Following the recommendations of previous assessment reports, Fife Council also established a new monitoring site for NOx and PM10 in Bonnygate, Cupar. This monitoring site commenced for PM10 in December 2005 and for NOx in January 2006. Some initial data from this new site are also provided in this report.

Fife Council Transportation Department have undertaken some short term CO monitoring at a number of locations (see section 3.3.5).

Additional air quality monitoring data available for Fife are as follows

- NO_2, SO_2, benzene and 1,3-butadiene data from a study of air quality around the Grangemouth refinery,
- Benzene data from a study around Hound Point oil tanker berth
- SO_2 data from a monitoring site operated on behalf of Longannet Power Station.

3.3.1 Automatic Monitoring Sites

Two mobile monitoring stations were operated by Fife Council during 2005; one is permanently located at a roadside site in Kincardine and the other was moved from Tulliallan Primary School to Admiralty Road, Rosyth during 2004. In addition, a new automatic monitoring site for PM10 and NOx was established at Bonnygate, Cupar in late 2005.

The "Rollalong" monitoring unit has remained at the North Approach Road in Kincardine-on-Forth (grid reference 293191 687518). Monitoring at this site with the NO_x analyser and triplicate diffusion tubes continued at this site throughout 2005.

The "Groundhog" mobile monitoring unit operated at Admiralty Road, Rosyth (grid reference 311752, 683515) during the period in November 2004 to August 2005. The priority for this site was to determine PM10 concentrations over at least a 6-month period as only short-term PM10 measurements hade been undertaken previously.

A new automatic monitoring station for NOx and PM10 was installed at Bonnygate, Cupar during 2005 to better characterise concentrations at this location which had been identified as experiencing relatively high NO_2 concentrations from previous diffusion tube measurements.

Table 3.1 summarizes details of the automatic monitoring sites in Fife and further details are provided in Appendix 1.

Table 3.1 Automatic Monitoring Locations

Location	Site Type	Monitoring Equipment	Pollutants Measured
North Approach Road, Kincardine (Grid reference 293191 687518)	Roadside	Rollalong – NO_x Analyser (with diffusion tubes in triplicate)	NO_x, NO & NO_2
Admiralty Road, Rosyth (Grid reference 311752, 683515)	Roadside	Groundhog mobile monitoring unit (with diffusion tubes in triplicate)	NO_x, NO & NO_2, SO_2, CO and PM_{10}.
Bonnygate, Cupar (Grid reference 337401 714572)	Kerbside	Street enclosure with NOx and PM10 analysers (with diffusion tubes in triplicate)	NO_x, NO & NO_2 and PM_{10}.

The automatic analysers at Kincardine and Rosyth are calibrated every 24 hours, using standard calibration gases supplied by BOC. At Bonnygate, calibration gas cylinders supplied by Air Liquide are used for manual calibrations by the LSO.

An automatic monitoring site for SO_2 was operated on behalf of Longannet Power Station at Blair Mains – this is at the area identified by modelling as likely to experience the maximum impact of the power station plume.

3.3.2 Fife Council Nitrogen Dioxide Diffusion Tube Monitoring Sites

Fife Council operates an extensive NO_2 monitoring survey with monitoring sites in East, West and Central Fife.

As discussed in the previous Progress Reports, Fife Council has made a number of changes to the NO_2 monitoring sites. Some sites were re-located, and at others the number of diffusion tubes was increased from one to two or three. In particular, some tubes were re-sited at the facades of buildings, to better represent public exposure. Table 3.2 lists NO_2 diffusion tube monitoring sites operating during all or part of 2005.

Table 3.2 Location of NO_2 Diffusion Tubes in 2005

Site Location	Site Code	Type	Start Date	End Date	East	North	Comments
West area							
Halbeath Bypass	D8	K	1999	2003	312883	688584	Discontinued
Bothwell Street, Dunfermline	AQM3	K	1999	2003	309513	686895	Moved to building façade of St Leonards School
St Leonards Primary School, Dunfermline		R(F)	2004	-			Replaces Bothwell St site
Carnegie Drive, Dunfermline	AQM4	K	1999	-	309467	687625	Relocated to Pittencrieff St
Carnegie Drive (A), Dunfermline	C'GIE DR A	R (F)	2004	-			Triplicate tube
Carnegie Drive (B), Dunfermline	C'GIE DR B	R (F)	2004	-			Triplicate tube
Carnegie Drive (C), Dunfermline	C'GIE DR C	R (F)	2004	-			Triplicate tube
Rumblingwell, Dunfermline (5N) *	DRM5	R	1996	-	307866	688231	* In UK NO_2 Network
Aytoun Grove, Dunfermline (6N)*	DRM6	UB		-	308328	688426	* In UK NO_2 Network
Admiralty Road, Rosyth	AQM5	K	1999	-	312103	683439	
Admiralty Road (A), Rosyth	ADM RO A	R (F)	2004	-	312140	683439	Triplicate tube
Admiralty Road (B), Rosyth	ADM RO B	R (F)	2004	-	312140	683439	Triplicate tube
Admiralty Road (C), Rosyth	ADM RO C	R (F)	2004	-	312140	683439	Triplicate tube
Barrie Street, Dunfermline (8N)*	DRM8	UB		-	308379	688249	* In UK NO_2 Network
Appin Crescent (A), Dunfermline (9N)*	DRM9A	R	1999	-	309882	687713	In UK NO_2 Network Triplicate tube
Appin Crescent (B), Dunfermline (9N)*	DRM9B	R	2004	-	309882	687713	Triplicate tube
Appin Crescent (C), Dunfermline (9N)*	DRM9C	R	2004	-	309882	687713	Triplicate tube
Appin Crescent (1) Dunfermline	APP CR1	R (F)	2004	-			
Appin Crescent (2) Dunfermline	APP CR2	R (F)	2004	-			
High Street, Cowdenbeath	C'BEATH	K	1996	-	316523	691740	
North Approach Road (1)	K'DINE1	K	1996	-	293182	687530	

Site Location	Site Code	Type	Start Date	End Date	East	North	Comments
Kincardine							
North Approach Road (2) Kincardine	K'DINE2	K	1996	-	293182	687530	
North Approach Road (A) Kincardine	ROLLALONG A	R	2004	-	293191	687518	Co-location study Triplicate tube
North Approach Road (B) Kincardine	ROLLALONG B	R	2004	-	293191	687518	Co-location study Triplicate tube
North Approach Road (C) Kincardine	ROLLALONG C	R	2004	-	293191	687518	Co-location study Triplicate tube
Main Street, Carnock	D12	K	1999	2003	304221	689064	Discontinued
Central Area							
Esplanade, Kirkcaldy	ESPLANADE	K	1996	2003	327863	690262	Discontinued
St Clair Roundabout Kirkcaldy		K	1996	2003	329084	692612	Discontinued
St Clair Street (1), Kirkcaldy	ST CLAIR 1	R(F)	2004	-	329105	692992	
St Clair Street (2), Kirkcaldy	ST CLAIR 2	R(F)	2004	-	329185	693055	
Wedderurn Road, Kirkcaldy	WEDDERBURN	UB		-	325288	693086	
Redhouse Roundabout, Kirkcaldy	REDHOUSE R/B	K	1996	2003	329198	695281	Discontinued
Lovat Road, Glenrothes	LOVAT RD	K	1996	-	328600	699470	
North Street, Glenrothes		I		2003	327062	701115	Discontinued
Dunnikier Rd, Kirkcaldy	DUNNIKIER	R (F)	2004	-	328152	692350	
Victoria Rd, Kirkcaldy	VICTORIA	R (F)	2004	-	328152	692325	
Glenlyon Road, Levenmouth	GLENLYON	K	1998	-	337357	701318	
Bawbee Bridge, Levenmouth	BAWBEE BR	K	1998	2003	337787	700402	Discontinued
Chapel Roundabout, Kirkcaldy	CHAPEL R/B	K	1998	2003	325023	694405	Discontinued
Leslie Roundabout, Glenrothes	LESLIE R/B	K	1998	2003	326350	701938	Discontinued
Leslie High St	LESLIE HIGH ST	R(F)	2004	-	325111	701806	
Queensway, Glenrothes	QUEENSWAY	K	1999	-	327849	701114	
Adsa Roundabout, Kirkcaldy	ASDA R/B	K		-	328735	694053	
East area							
City Road (1), St Andrews (1N)* (A)	-75	R	1996	-	350586	716580	In UK NO_2 Network Duplicate tube
City Road (2), St Andrews (B)	-76	R	2004	-	350586	716580	Duplicate tube
Bell Street (1), St Andrews	-77	R	1997	-	350708	716716	
Bell Street (2) St Andrews	-78	R(F)	2004	-	350716	716669	
Market Street,St Andrews	-84	R	1997	2003	350899	716744	Discontinued
South Street, St Andrews	-85	K	1997	2003	351060	716642	Discontinued
Windsor Gdns, St Andrews (4N)*	-79	UB		-	349122	715313	* In UK NO_2 Network
Crossgate, Cupar	-83	K		-	337538	714527	
South Road, Cupar	-82	R		-	337513	713616	
Cupar Road, Auchtermuchty	-80	R		-	324186	711801	
Millfield, Cupar (4N)*	-81	UB		-	336867	713878	* In UK NO_2 Network
Bonnygate, Cupar (1N)* Bonnygate 1	-73	R	1996	-	337411	714572	* In UK NO_2 Network
Bonnygate, Cupar Bonnygate 2	-74	R(F)	2004	-	337250	714750	
Bonnygate, Cupar Bonnygate 3 (A)		R(F)	2005	-	337455	714605	Duplicate tube
Bonnygate, Cupar Bonnygate 3 (B)		R(F)	2005	-	337455	714605	Duplicate tube
Bonnygate, Cupar Bonnygate 4		R(F)	2005	-	337440	714560	

K = Kerbside, 0-1m from the kerb of a busy road
R = Roadside, 1-5m from the kerb
R(F) = façade of buildings on street
I = Intermediate, 20-30m from the kerb
UB = Urban Background, >50m from any busy road

Maps of showing the locations of all these diffusion tube sites been provided in previous reports and are therefore not included in this report.

Following the annual review of monitoring undertaken by Fife Council, additional diffusion tubes are being installed for 2006 to better assess and delineate concentrations in areas where elevated levels are currently measured. The details of these new monitoring sites are given in Chapter 8 – assessment of nitrogen dioxide – and maps of their locations are provided in Appendix 1.

3.3.3 Benzene and 1,3-Butadiene Monitoring

As part of the commitment of Innovene Manufacturing (Scotland) Ltd (formerly BP Oil) to monitor any potential environmental impact from its Grangemouth oil refinery on the surrounding area, the National Physical Laboratory (NPL) conducts an ongoing ambient air quality survey over a wide area around the Forth Estuary[6]. Measurements are made at 22 sites using passive diffusion tube techniques. NO_2, SO_2 and a range of organic pollutants including benzene and 1,3-butadiene are monitored using diffusive samplers, with analysis being conducted by Analytical Data Services Ltd on behalf of NPL. The latest data available are for the 12-month period July 2004 to July 2005. (The results from this study are only available for 12-month periods starting and ending July, not calendar years). The NPL survey covers a wide area, and four of the sites are situated in Fife. These are as follows (grid references are not available):

- Ford View, Cairneyhill
- Shoreline near Charlestown Harbour
- Mercer Road, Kincardine
- Shoreline, Culross

Results from these sites are included in the appropriate Chapters of this report.

Measurements of benzene and other hydrocarbon compounds are also undertaken by NPL on behalf of BP Exploration Operating Company Ltd in the vicinity of Hound Point[8]. These results are presented in Chapter 5.

3.3.4 SO_2 Monitoring

Two sites in Fife were part of the Smoke and SO_2 network- this network ceased operation at the end of 2005. The sites in Fife were at Broad Street Primary School, Cowdenbeath (COWDENBEATH 1) and at Templehall Community Centre, Kirkcaldy (KIRKCALDY 6). These sites monitor net acidity as SO_2 equivalent. The site at Templehall ceased in April 2005 and hence the data are not used in this report. The site at Cowdenbeath also ceased in April 2006.

Sulphur dioxide diffusion tube monitoring has been discontinued at Victoria Road, Leven, East Toll, Burntisland and Derran Drive, Cardenden. To replace these locations, a triplicate tube site was established at Markinch, close to Tullis Russell Papermakers. Sulphur dioxide diffusion tube monitoring continues at the Valleyfield site close to Longannet Power Station and at the site in Culross Main Street.

The Groundhog monitoring facility at Admiralty Rd, Rosyth also includes monitoring of sulphur dioxide and, as noted in section 3.3.1, SO_2 data are also available for the Blair Mains site operated on behalf of Longannet Power Station[9].

Results for SO_2 monitoring are presented in Chapter 9.

3.3.5 Carbon Monoxide Monitoring

The Groundhog monitoring facility at Admiralty Rd, Rosyth includes monitoring of carbon monoxide.

In addition, Fife Council Transportation Services have re-commenced carbon monoxide monitoring at a selection of sites across Fife, using "Marksman 660" street monitors. During 2005, short period monitoring was undertaken at:

Site 1 A985T/A977/A876 Junction, Kincardine
Site 13 Carnegie Drive/Pilmuir Street, Dunfermline
Site 34 Bonnygate, Cupar (Crossgate Traffic Lights)
Site 35 Appin Crescent
Site 919 Bell Street, St Andrews

The results for carbon monoxide monitoring during 2004/5 are summarised in Chapter 3.

3.3.6 PM10 Monitoring

It was recognised in previous reports that there was insufficient data on PM10 concentrations in Fife. To address this issue, Fife Council established PM10 monitoring with a TEOM analyser within the Groundhog monitoring facility at Admiralty Road, Rosyth. Monitoring commenced in November 2004 and continued till August 2005.

In addition, Fife Council has established a new monitoring site for NOx and PM10 at Bonnygate, Cupar. PM10 monitoring at this site commenced in December 2005.

PM10 data are summarised in Chapter 10.

3.4 ROAD TRAFFIC DATA

3.4.1 Summary of traffic data provided

Fife Council Transportation Services have provided comprehensive traffic data for Fife for the purposes of this report.

Data were provided for

- Fife roads in general,
- Motorways and Trunk roads
- Narrow congested streets and trunk roads
- Busy streets where people are exposed
- Roads with high flows of busses or HGVs
- Bus station departures

In addition, intersections between these roads were highlighted.

The Council provided estimates for the annual average daily traffic flow in 2005 and 2010, percentage HGVs and average speed.

3.4.2 Proportion of HGVs

Fife Council provide data on the proportion of HGVs on all roads. The proportion of HGVs is determined mainly from traffic counters, where available, or from historic manual count data. Where no data are available, an estimate has been made based on local knowledge or by comparison with similar roads.

3.4.3 Base year for traffic

The base year for the traffic data was 2003, 2004 or 2005 in most cases with a few roads based on 2001 data.

3.4.4 Traffic growth

Future year traffic flow data have been calculated by Fife Council using the following factors:

- Fife Council Roads - 1.18% per year (NRTF Total Traffic Low Rate 2006-2011 but for all years)
- All Trunk Roads - 1.99% per year pre-2006, 1.83% per year post-2006 (NRTF Total Traffic High Rate)
- All Roads in Centre/West Dunfermline, or affected by Dunfermline Eastern Expansion (DEX) - 1.99% per year pre-2006, 1.83% per year post-2006 (NRTF Total Traffic High Rate).

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

For DMRB modelling of road links used in the NAEI, default receptor distances of 5m for single carriageway roads, 10m for dual carriageway roads and 15m for motorways were used.

For the initial screening with DMRB distances from the centre of the road to the receptor were calculated on the as follows:

Distance from centre of road to receptor = (0.5*width of road) +2m

Where this gave possible exceedences, more detailed information on actual distances to likely receptors was obtained from Fife Council.

3.5 INDUSTRIAL PROCESSES

Summarised information on industrial emission in the Fife area was received from the SEPA Stirling and Glenrothes teams. This information is incorporated into this assessment report within the relevant pollutant chapters. In addition, SEPA provided a complete list of industrial process in Fife, from the SEPA pollution register. These data are provided in Appendix 3.

3.6 SCREENING TOOLS

Appendix 4 includes outline details of the DMRB screening tool used in the assessment.

3.7 SUMMARY OF CONCLUSIONS OF THE UPDATING AND SCREENING ASSESSMENT 2003 AND THE 2004 AND 2005 PROGRESS REPORTS

Carbon Monoxide – data reported in the Updating and Screening Report and the two annual Progress Reports indicate that the Air Quality Objective for carbon monoxide is unlikely to be exceeded.

Benzene – data reported in the Updating and Screening Report and the two annual Progress Reports indicate that the Air Quality Objective for benzene is unlikely to be exceeded.

1,3-butadiene - data reported in the Updating and Screening Report and the two annual Progress Reports indicate that the Air Quality Objective for 1,3-butadiene is unlikely to be exceeded.

Lead – the Updating and Screening Report concluded that industrial emissions of lead were unlikely to lead to any exceedence of the Air Quality Objective for lead. No further monitoring has been undertaken. The progress reports confirmed that a Detailed Assessment is not required for lead.

Nitrogen Dioxide – the 2003 Updating and Screening Report identified that high NO_2 concentrations were recorded at kerbside locations in North Approach Road, Kincardine, Carnegie Drive, Dunfermline and Admiralty Road, Rosyth. However, this was based on data from kerbside diffusion tube monitoring sites and the Progress Report recommended that monitoring be undertaken at the façade of buildings for a better assessment of likely exposure. This adjustment to the monitoring programme was carried out during 2004 (by Fife Council) and is reported in the 2005 Progress Report.

Following recommendations in the Progress Report automatic monitoring NO_2 has been undertaken at Admiralty Road, Rosyth and automatic monitoring continues at North Approach Road, Kincardine. Additional automatic monitoring was also planned for other sites, in particular Bonnygate, Fife.

Information from the revised monitoring programme is reviewed in this Updating and Screening Report.

Sulphur Dioxide - data reported in the Updating and Screening Report and the two annual Progress Reports indicate that the Air Quality Objective for sulphur dioxide is unlikely to be exceeded.

PM10 – the 2004 Progress Report recommended that longer duration PM10 monitoring be undertaken. This has being addressed by a monitoring programme at Admiralty Road, Rosyth. Though the 2004 Progress Report recommended that further PM10 monitoring also be carried out at Tulliallan School subsequent information indicated that other sites were of higher priority. Hence, Fife Council have installed an additional PM10 automatic monitoring site at Bonnygate, Cupar.

4 Carbon Monoxide (CO)

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. The automatic monitoring network recorded no exceedences of the objective in 2005 at any location across the UK.

4.2 STANDARD AND OBJECTIVE FOR CARBON MONOXIDE

In Scotland, the 8-hour running mean concentration of 10.0 mgm^{-3} has been adopted as the air quality standard for carbon monoxide. The Air Quality Objective is to achieve this standard by the end of 2003.

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

Data reported in the Updating and Screening Report of 2003 and the two subsequent annual Progress Reports indicate that the Air Quality Objective for carbon monoxide is unlikely to be exceeded in Fife.

4.4 SCREENING ASSESSMENT OF CARBON MONOXIDE

4.4.1 Screening check list

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

- Monitoring Data
- Very Busy Roads or junctions in built up areas

These are described in the following sections.

4.4.2 Background Concentrations of carbon monoxide

The average background annual mean concentration of carbon monoxide for Fife in 2005 estimated from the UK background maps and the appropriate year adjustment factor (http://www.airqualityarchive.co.uk/archive/laqm/tools.php) was 0.12mg m^{-3}, with a maximum concentration of 0.19mg m^{-3} in 2005 close to the A823(M) spur from the M90 in the between Dunfermline and Rosyth.

4.4.3 Screening assessment

A. Monitoring data

Carbon monoxide monitoring was undertaken at Admiralty Road, Rosyth (as part of the "Groundhog" monitoring facility) for the period 1 Nov 2004 to 25 August 2005. The monitoring facility was operated by Dundee City Council Scientific Services on behalf of Fife Council.

During the whole period of monitoring, the maximum 8-hour running mean was 2.9 mg m^{-3} (recorded on 16 February 2005), well within the AQS Objective of 10 mg m^{-3}.

Table 4.1 Automatic CO Monitoring data – Admiralty Rd, Rosyth

Period	Maximum 8 – hour running mean (mg m^{-3})
November 2004 – August 2005 (9 months)	2.9

As in previous years, short periods of carbon monoxide monitoring have also been undertaken by Fife Council Transportation Services at a number of roadside locations. The results are summarised in Table 4.2. All measurements for 2005 are included in the table for completeness, but only the data for Site 34, Bonnygate, Cupar (30/08 – 05/09/2005) and Site 919, Bell Street, St Andrews (30/08 – 05/09/2005) were not included in the last progress report.

Table 4.2 Roadside Carbon Monoxide Monitoring

Site Number and Location		Monitoring Period	Maximum 8-hour concentration mg m^{-3}
Site 1	A985T/A977/A876 Junction, Kincardine	28/01 – 03/02/2005	1.3
Site 13	Carnegie Drive/Pilmuir Street, Dunfermline	28/01 – 03/02/2005	3.0
Site 34	Bonnygate, Cupar (Crossgate Traffic	19/02 – 25/02/2005	1.2
Lights)		30/08 – 05/09/2005	0.9
Site 35	Appin Crescent	08/03 – 14/03/2005	1.1
Site 919	Bell Street, St Andrews	30/08 – 05/09/2005 (16.00 – 24.00 only)	1.6

Whilst none of these monitoring periods are sufficiently long to permit a full assessment of carbon monoxide concentrations over a full annual period, they all indicate that concentrations are likely to be well below the Air Quality Strategy Objective of 10.0 mgm^{-3} for the running 8-hour mean concentration.

B. Road Traffic – very busy roads or junctions in built up areas
No very busy roads (>80,000 vehicles per day) have been identified in Fife. The road with the highest traffic flow in Fife was identified as the A90 Forth Road Bridge North (Welldean Lay-by) which had an estimated AADT in 2005 of 68,041.

The busiest road junction was identified as the J3 roundabout on the M90 to the east of Dunfermline. The combine flow at this junction was estimated at just below 72,000 vehicles per day, calculated as 2/3 of the total of the 3 intersecting roads.

The busiest non-motorway junction is the roundabout junction between the A921 and the A92(T) which has an estimated combined traffic flow of about 63,000 vehicles per day.

4.5 CONCLUSION FOR CARBON MONOXIDE

On the basis of the monitoring and traffic data, Fife Council is not required to carry out a Detailed Assessment for carbon monoxide.

5 Benzene

5.1 THE NATIONAL PERSPECTIVE

The main sources of benzene emissions in the UK are petrol-engined vehicles, petrol refining, storage and the distribution and uncontrolled emissions from petrol station forecourts without vapour recovery systems. A number of policy measures already in place, or planned for future years, will continue to reduce emissions of benzene. Since January 2000, EU legislation has reduced the maximum benzene content of petrol to 1%, from a previous upper limit of 5%. The European Auto-Oil programme will further reduce emissions for cars and light-duty vehicles, and emissions of benzene from the storage and distribution of petrol are controlled by vapour recovery systems. The UK automatic monitoring network recorded no exceedences of the 2003 objective in 2003, or later years. Whilst the 2010 objectives are expected to be met at all urban background, and most roadside locations, there is the possibility for some remaining exceedences, which will require additional measures at a local level.

5.2 STANDARD AND OBJECTIVE FOR BENZENE

Within the UK, a running annual mean concentration of 16.25 μgm^{-3} has been adopted as the air quality standard for benzene, with an objective for the standard to be achieved by the end of 2003. In addition, in Scotland, a further objective has been established – to achieve a running annual mean of 3.25μgm^{-3} by 2010.

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

Data reported in the Updating and Screening Report of 2003 and the two subsequent annual Progress Reports indicate that the Air Quality Objective for benzene is unlikely to be exceeded in Fife.

5.4 SCREENING ASSESSMENT OF BENZENE

5.4.1 Screening check list

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

- Monitoring Data outside an AQMA
- Monitoring Data within an AQMA
- Very Busy Roads or Junctions in Built-up Areas
- New Industrial Sources
- Industrial sources with substantially increased emissions or new relevant exposure
- Petrol Stations
- Major Fuel Storage Depots (Petroleum only)

These are described in the following sections.

5.4.2 Background concentrations for benzene

The average background annual mean concentration of benzene, for Fife in 2005 estimated from the UK background maps and the appropriate year adjustment factor (http://www.airqualityarchive.co.uk/archive/laqm/tools.php) was 0.15μgm^{-3}, with a maximum concentration of 0.39μgm^{-3} located to the south of Dunfermline. The projected concentrations for 2010 are even lower, with an average concentration of 0.13μgm^{-3}, and a maximum 0.33μgm^{-3}. Though these values are calculated on an annual average basis, rather than a running annual mean basis, they indicate that concentrations are well below the respective objectives.

5.4.3 Screening assessment

A. Monitoring Data outside of an AQMA

Fife Council carried out no new benzene monitoring. However, data are available from the ambient air quality survey, undertaken by NPL, for Innovene (and formerly BP Oil) in the area surrounding the Grangemouth oil refinery in Falkirk District[6]. Results for the four sites within Fife for the 12-month period July 2004-July 2005 are shown in Table 5.1. The results have been converted from ppb into mass units at 20^{O}C and 1 atmosphere.

Table 5.1 Benzene Diffusion Tube Annual Mean Concentrations (µg m^{-3}) from the NPL network around Grangemouth[6] (sites in Fife only)

Site code	Location	1999 – 2000	2000 - 2001	2001 – 2002	2002 - 2003	2003 - 2004	2004 – 2005
16	Ford View, Cairneyhill	0.98	0.98	0.65	0.98	0.98	0.65
17	Shoreline nr. Charlestown Harbour	0.98	1.30	0.65	0.98	0.98	0.98
20	Mercer Road, Kincardine	1.30	0.98	0.98	0.65	0.65	0.65
21	Near Shoreline, Culross	0.98	0.98	0.98	0.98	0.98	0.98

As in previous years, annual mean benzene levels, for the 12-month period July 2004 – July 2005, were well below the AQS objective (for the running annual mean) of 16.25µg m^{-3} for the end of 2003, and within the AQS objective of 3.25 µg m^{-3} for 2010. Ambient benzene concentrations do not appear to be increasing.

The Innovene Grangemouth oil refinery (which is not within Fife) has been shown to have no impact on the air quality in the Fife region.

As in previous years, the report of the Mossmorran and Braefoot Bay Independent Air Quality Monitoring Review Group[7] report for 2004 concluded that "the work undertaken in 2004 demonstrates that the facilities at Mossmorran and Braefoot Bay continue to pose no significant risk to the health of the local community".

BP Exploration continues its monitoring of a range of hydrocarbon species at 12 locations on either side of the Forth river around the Hound Point tanker berth[8].

Table 5.2 Benzene Diffusion Tube Annual Mean Concentrations (µg m^{-3}) from the NPL network around Hound Point[8]

Site code	Location	2002 - 2003	2003 – 2004	2004 – 2005
1	Carlowirie Cr, Dalmeny, Edinburgh	1.3	1.0	1.0
2	Near Whitehouse Point, South Queensferry	1.3	1.0	1.0
3	Carmolite Rd, South Queensferry	1.0	1.0	1.0
4A	Queens Ferry Lodge, North Queensferry, Fife	1.3	1.0	1.0
4B	Nr The Old Battery, North Queensferry, Fife	1.6	1.3	1.0
5	Breakers Way, Dalgety Bay, Fife	1.0	1.0	1.0
6	Hopewood Mews, Dalgety Bay, Fife	1.0	1.0	1.0
9	Coast between Aberdour and Burntisland, Fife	1.0	1.0	1.0
10	Brigg's Yard, Burntisland, Fife	1.0	1.0	0.7
11	Belvedere Hotel, West Wemyss, Fife	1.0	1.0	1.0
13	Forth View Hotel Aberdour, Fife	1.0	1.0	0.7
16	Braefoot Point, Fife	1.0	1.0	0.7

The results show that annual mean benzene levels, for the 12-month period September 2004 – September 2005, were well below the AQS objective (for the running annual mean) of 16.25µg m^{-3} for the end of 2003, and within the AQS objective of 3.25 µg m^{-3} for 2010.

B. Monitoring data within AQMA

An AQMA has not been declared in Fife.

C. Road Traffic – very busy roads and junctions in built up areas

No very busy roads (>80,000 vehicles per day) have been identified in Fife. The road with the highest traffic flow in Fife was identified as the A90 Forth Road Bridge North (Welldean Lay-by) which had an estimated AADT in 2005 of 68,041.

The busiest road junction was identified as the J3 roundabout on the M90 to the east of Dunfermline. The combine flow at this junction was estimated at just below 72,000 vehicles per day, calculated as 2/3 of the total of the 3 intersecting roads.

The busiest non-motorway junction is the roundabout junction between the A921 and the A92(T) which has an estimated combined traffic flow of about 63,000 vehicles per day.

D. New industrial sources
There are no new industrial sources in Fife. However, two new PPC permits have been issued for Fife, a Part B for the coating process at FMC, Pitreavie Business Park, Dunfermline (solvent consumption exceeded threshold) and a Part A Inorganic Chemical process at Lexmark, Rosyth. Both these installations were existing but are new to regulation under PPC. There should be no major change to emissions from these processes. Though the VOC emissions from FMC are likely to have increased proportionately with increased production, these do not include either benzene or 1,3-butadiene.

E. Industrial sources with substantially increased emissions or relevant exposure
None

F. Petrol stations with an annual throughput of over 2000 cubic metres of petrol
None

G. Major fuel storage depots (petrol only)
None

5.5 CONCLUSION FOR BENZENE

On the basis of this monitoring data, Fife Council is not required to carry out a Detailed Assessment for benzene.

6 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 all well below the 2003 objective of 2.25 μgm^{-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.

6.2 STANDARD AND OBJECTIVE FOR 1,3-BUTADIENE

The Air Quality Standard and Objective for 1,3-butadiene in Scotland are the same as in the rest of the UK. The standard is a maximum running annual mean concentration of 2.25 μgm^{-3} and the objective is for the standard to have been achieved by the end of 2003.

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

Data reported in the 2003 Updating and Screening Report and the two subsequent annual Progress Reports indicate that the Air Quality Objective for 1,3-butadiene is unlikely to be exceeded.

6.4 SCREENING ASSESSMENT OF 1,3-BUTADIENE

6.4.1 Screening check list

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, or new relevant exposure

These are described in the following sections.

6.4.2 Background concentrations for 1,3-Butadiene

The average background 1,3-butadiene concentration for 2005 in Fife, estimated from the UK background maps and the year adjustment factors, was 0.03 μgm^{-3} with a maximum concentration of 0.08 μgm^{-3}. These very low concentrations indicate that it is very unlikely that the air quality Standard for 1,3-butadiene will be exceeded in Fife. The location of the maximum concentration was in the same location as that for benzene

6.4.3 Screening assessment

A. Monitoring data

Fife Council carried out no new monitoring for this pollutant in 2004. The Innovene ambient air quality survey, undertaken by NPL, in the vicinity of Grangemouth refinery[6] included 1,3-butadiene. Results for the four sites within Fife for the 12-month period July 2004-July 2005 are shown in Table 6.1. The results have been converted from ppb into mass units at $20^{O}C$ and 1 atmosphere.

Table 6.1 1,3-Butadiene Diffusion Tube Annual Mean Concentrations (µg m^{-3}) from the NPL network (sites in Fife only)

Site code	Location	1999 - 2000	2000 - 2001	2001 - 2002	2002 - 2003	2003 - 2004	2004 – 2005
16	Ford View, Cairneyhill	0.25	0.14	0.11	0.16	0.09	<0.1
17	Shoreline nr. Charlestown Harbour	0.32	0.18	0.14	0.14	0.14	<0.1
20	Mercer Road, Kincardine	0.23	0.11	0.11	0.14	0.11	<0.1
21	Near Shoreline, Culross	< 0.23	0.18	0.11	0.14	0.18	<0.1

All sites in Fife appear to meet the AQS running annual mean objective of 2.25µg m^{-3} set for 31 December 2003.

The report of the Mossmorran and Braefoot Bay Independent Air Quality Monitoring Review Group[7] report for 2004 concluded that "the work undertaken in 2004 demonstrates that the facilities at Mossmorran and Braefoot Bay continue to pose no significant risk to the health of the local community".

B. New industrial sources
There are no new industrial sources in Fife. However, two new PPC permits have been issued for Fife, a Part B for the coating process at FMC, Pitreavie Business Park, Dunfermline (solvent consumption exceeded threshold) and a Part A Inorganic Chemical process at Lexmark, Rosyth. Both these installations were existing but are new to regulation under PPC. There should be no major change to emissions from these processes. Though the VOC emissions from FMC are likely to have increased proportionately with increased production, these do not include benzene or 1,3-butadiene.

C. Industrial sources with substantially increased emissions or relevant exposure
None

6.5 CONCLUSION FOR 1, 3- BUTADIENE

On the basis of this monitoring data, Fife Council is not required to carry out a Detailed Assessment for 1,3-butadiene.

7 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) 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 exceedences 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 Air Quality Standard for Lead is 0.5 μgm^{-3} as an annual average, with an objective for the standard to have been achieved by the end of 2004. In addition, a lower air quality objective of 0.25 μgm^{-3} annual average to be achieved by the end of 2008 has also been set.

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

The 2003 Updating and Screening Report concluded that industrial emissions of lead were unlikely to lead to any exceedence of the Air Quality Objective for lead. No further monitoring has been undertaken. The progress reports confirmed that a Detailed Assessment is not required for lead

7.4 SCREENING ASSESSMENT OF LEAD

7.4.1 Source checklist

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

- Monitoring Data
- New Industrial Sources
- Existing Industrial Sources with Significantly Increased Emissions or new relevant exposure

These are described in the following sections.

7.4.2 Screening assessment

A. Monitoring data

There are no new data to report. The previous Updating and Screening assessment concluded that emissions of lead from industrial processes in Fife are not likely to exceed the objectives for lead to be achieved in 2004 and 2008.

B. New industrial sources

No new industrial premises likely to emit lead.

C. Industrial sources with substantially increased emissions or relevant exposure
None

7.5 CONCLUSION FOR LEAD

Fife Council is not required to carry out a Detailed Assessment for lead.

8 Nitrogen Dioxide (NO_2)

8.1 THE NATIONAL PERSPECTIVE

The principal source of NO_x emissions is road transport, which accounted for about 40% of total UK emissions in 2003. 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 for 2005 is considerably more demanding than achieving the 1-hour objective. By 2005, the annual mean objective was being achieved at all urban background locations outside of London, but being exceeded more widely at roadside sites throughout the UK in close proximity to busy road links.

8.2 STANDARDS AND OBJECTIVES FOR NITROGEN DIOXIDE

There are two Air Quality Standards for nitrogen dioxide, as an annual mean concentration of 40μgm^{-3}, and a 1-hour mean concentration of 200μgm^{-3} not to be exceeded more than 18 times per year. The Objective is to achieve these Standards by the end of 2005.

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

The 2003 Updating and Screening Report identified that high NO_2 concentrations were recorded at kerbside locations in North Approach Road, Kincardine, Carnegie Drive, Dunfermline and Admiralty Road, Rosyth. However, this was based on data from kerbside diffusion tube monitoring sites and the Progress Report of 2004 recommended that monitoring be undertaken at the façade of buildings for a better assessment of likely exposure. This adjustment to the monitoring programme was carried out during 2004 (by Fife Council) and was reported in the 2005 Progress Report.

Following recommendations in the Progress Report automatic monitoring NO_2 has been undertaken for 6-months duration at Admiralty Road, Rosyth and automatic monitoring continues at North Approach Road, Kincardine. Additional automatic monitoring was also planned for other sites, in particular Bonnygate, Fife.

Information from the revised monitoring programme is reviewed in this Updating and Screening Report.

8.4 SCREENING ASSESSMENT OF NITROGEN DIOXIDE

8.4.1 Screening checklist

The Technical Guidance LAQM TG(03)[2] 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 last round of review and assessment
- Roads with significantly changed traffic flows or new, relevant exposure
- Bus Stations

- New industrial sources
- Industrial sources with substantially increased emissions or new relevant exposure
- Aircraft

These are evaluated in the following sections.

8.4.2 Background concentrations for nitrogen dioxide

The estimated annual average and maximum background nitrogen oxides (NOx) and nitrogen dioxide (NO_2) concentrations for 2005 and 2010 are shown in Table 8.1.

Table 8.1 Annual average and maximum background nitrogen oxides and nitrogen dioxide concentrations in Fife for 2005 and 2010

	Nitrogen Oxides		Nitrogen Dioxide	
	Average μgm^{-3}	Maximum μgm^{-3}	Average μgm^{-3}	Maximum μgm^{-3}
2005	7.25	21.7	5.69	17.1
2010	5.90	16.9	4.62	13.2

The location of the maximum concentration for both NOx and NO_2 was at the M90/A823(M) motorway junction to the south east of Dunfermline.

For the purposes of DMRB modelling of NO_2 concentrations in 2005 for the data supplied by Fife Council, a background 1*1km square covering a residential area of Glenrothes has been selected. The grid reference of the centre of this square is 327500,700500 and the estimated background concentrations in 2005 for NOx was 18.5μgm^{-3} and for NO_2, 15.6μgm^{-3}.

8.4.3 Screening assessment

A. Monitoring data outside AQMA

Automatic NO_2 Monitoring at North Approach Road, Kincardine

Fife Council have been undertaking continuous measurements of NO_X (NO, NO_2 and NO_X) at a roadside site on the North Approach road in Kincardine-on-Forth (grid reference 293191 687518). Data capture for the calendar year 2005 was 81%. The annual mean NO_2 concentration measured by this system was 24μgm^{-3} for 2005. This is within the AQS objective of 40 $\mu g\ m^{-3}$ for the annual mean and lower than the 2004 annual average at this site of 31$\mu g\ m^{-3}$.

There were no exceedences of the 1-hour air quality objective of 200$\mu g\ m^{-3}$ indeed even the maximum 15min average did not exceed this threshold. One hour of exceedence was recorded in 2003 and up to 18 are permitted in any calendar year.

Using the 2005 annual mean NO_2 concentration, it is possible to predict annual means for future years using the approach set out in the Guidance LAQM TG (03) (updated version Jan 2006). Estimated concentrations for 2010 are shown in Table 8.2.

Table 8.2 Data from Kincardine Roadside Automatic NOx Monitoring Site

Site	Year	Data Capture	Max. 1-hour mean NO_2, μgm^{-3}	No. of 1-hour means > 200 μgm^{-3}	99.8th %ile of 1-hour mean NO_2, μgm^{-3}	Annual Mean NO_2, μgm^{-3}	Predicted 2005 Annual Mean NO_2, μgm^{-3}	Predicted 2010 Annual Mean NO_2, μgm^{-3}
North Approach Road, Kincardine	2003	86%	248	1	-	38	36	30
	2004	96%	135	0	-	31	30	26
	2005	81%	138	0	-	24	-	21

The measured annual mean for 2005, and the predicted annual mean for 2010, are within the AQS objective of 40μgm^{-3}.

In addition, traffic on this section of road reduced considerably in October 2004 with the opening of the Kincardine Eastern Link Road (see Section 3.2.5). Hence, the reduction in NO_2 concentrations seen in 2005 is in line with expectations – and further reductions are anticipated after 2008 when the planned new bridge crossing and the northern approach bypass road are completed.

Automatic NO_2 Monitoring at Admiralty Road, Rosyth
During 2004 a new roadside monitoring location was established at Admiralty Road, Rosyth.

Unfortunately there was a problem with the NOx analyser for a considerable period, and NOx data are only available for the period 11 July 2005 – 25 August 2005 (approx 1.5 months). Hence, the data cannot be considered as representative for a full year, but are presented here for information.

Table 8.3 Data from Admiralty Road, Rosyth Automatic NOx Monitoring Site

Site	Monitoring period	Max. 1-hour mean NO_2 µg m^{-3}	No. of 1-hour means > 200 µg m^{-3}	Annual Mean NO_2, µg m^{-3}
Admiralty Rd Rosyth	11/07/05 – 25/08/05	62	0	16

This mobile monitoring unit is shared with two other councils. In view of the problems experienced with the monitoring at this site, Fife Council propose to re-deploy the unit to this location, later in 2006, after its use by Dundee City Council.

Automatic NO_2 Monitoring at Bonnygate, Cupar
Fife Council installed a new automatic monitoring site for NOx and PM10 at Bonnygate, Cupar in late 2005. Provisional NO_2 data for the period 19 Jan 06 to 10 April 06 have been made available for this assessment – note however there are no data for about one month from early Feb to early March due to an interruption to the electricity supply to the site.

Table 8.4 Provisional Data from Bonnygate, Cupar Automatic NOx Monitoring Site

Site	Monitoring period	Max. 1-hour mean NO_2 µg m^{-3}	No. of 1-hour means > 200 µg m^{-3}	Mean NO_2, µg m^{-3}
Bonnygate, Cupar	19/01/06 – 10/04/06	227	1	40

This initial provisional data confirms that concentrations are elevated at this site, but data from the site over a longer period will be required to make any firm conclusions about possible exceedences of the Air Quality Objective for NO_2. Note also that this is a kerbside site approximately 0.5m from the kerb edge. Hence, concentrations measured at this site will generally be higher that those to which the public might be exposed to over a period of 1-hour.

QA/QC of the automatic monitoring data in Fife
Dundee City Council Scientific Services undertake quality control of the automatic data for Fife Council monitoring sites. Scientific Services have confirmed that their procedures generally follow the requirements of the Technical Guidance. This gives a high degree of confidence in the data obtained, both for reliable concentrations at the automatic sites and for bias correction data for the diffusion tubes.

NO_2 Diffusion Tube Monitoring Data

QA/QC of Diffusion Tubes
Dundee City Council Scientific Services laboratory participate in 3 schemes which ensure that the NO_2 tube results meet acceptable standards.

1. The WASP scheme which is run by the Health and Safety Laboratory in Sheffield. Each month one tube is sent for testing. Results are compared with other participating labs and feedback on performance provided.

2. Every three months the NETCEN/NO_2 network send 3 tubes and a blank for analysis. Again, results are compared with other participating labs and feedback on performance provided.

3. Each month a QC NO_2 solution is provided from DEFRA (UK Nitrogen Dioxide Network Analytical Performance Testing Scheme). This solution is run as a standard when for NO_2 tubes in the laboratory. The solution is tested after every 21 NO_2 tube samples.

Dundee also use in-house quality assurance standards. The tube preparation method is 20%TEA in water.

Bias Correction for Diffusion tubes: Co-location Study at Kincardine
At the Kincardine North Approach Road roadside site, triplicate NO_2 tubes are co-located with the chemiluminescence analyse. Fife Council is using these data in an ongoing intercomparison of the diffusion tubes with the continuous analyser. Using the approach set out in Box 6.4 of the Guidance, the annual mean from the continuous analyser was used, together with the annual mean of the triplicate diffusion tube results, to determine the bias of the diffusion tubes relative to the reference chemiluminescence analyser. Only months with both a diffusion tube result and >75% data capture on the automatic monitor were used in the calculations of the annual means. Using this methodology, the bias correction factor A was calculated as 0.728

In addition, the data were entered in the Netcen diffusion tube bias correction spreadsheet which assesses bias on a month-by-month basis. Using this LAQM tool, the bias adjustment factor was calculated as 0.734, which is close to the original technical guidance method.

In view of this, an average of the two factors was calculated. **The average bias adjustment factor "A" of 0.731 has been used to correct the diffusion tube results in Fife for 2005**.

This factor is lower than in previous years (0.84 in 2004 and 0.81 in 2003). At present, no reason for this change can be found and no further comparison data for Dundee City Council Scientific Service are available. No collocation data for Dundee City Council Scientific Services for 2005 are available on the UWE Spreadsheet of Bias Adjustment Factors.

Fife Council Diffusion Tube Results
The annual mean nitrogen dioxide concentrations for 2005 are provided in Table 8.5 for Fife Council's diffusion tube sites. Predictions for 2010 have been based on forward projection of the results for 2005.

Table 8.5 Annual Mean Nitrogen Dioxide Concentrations from Fife Council Monitoring Sites (μgm^{-3})

West Area	Halbeath Bypass	Bothwell Street, Dunfermline	St Leonards Primary School Dunfermline	Carnegie Drive, Dunfermline	Carnegie Drive (A), (B), (C). Dunfermline (triplicate)			Rumblingwell Dunfermline (DUN5N)*	Aytoun Grove, Dunfermline (DUN6N)*
					A	B	C		
Type†	K	K	R(F)	K		R(F)		R	UB
Easting	312883	309513		309467				307866	308328
Northing	688584	686895		687625				688231	688426
2000 (U)	26	31		39				25	14
2001 (U)	31	35		41				27	17
2002‡	27	31		40				23	15
2003 (U)	36	46		53				35	20
2003‡	29	37		43				28	16
2004(U)	Discontinued	Discontinued	26[1]	47	36[1]	36[1]	37[1]	31	18
2004‡			22	39	30	30	31	26	15
2005(U)	**-**	**-**	**27**[2]	**44**	**39**	**37**	**38**	**29**	**17**
2005	**-**	**-**		**32**	**29**	**27**	**28**	**21**	**12**
Predicted 2010	-	-		28	25	24	24	18	10

† Defra classification K – Roadside, R – Roadside, UB – urban background. I – Intermediate sites are no longer used in the National network but are useful for additional local information, R(F) refers to roadside sites at the façade of buildings.
U Unbiased data
‡ Bias adjusted data using a Bias A of 0.78 for 2002 data 0.81 for 2003 and 0.84 for 2004 and 0.731 for 2005.
*Sites which are also part of the UK NO2 Network
1 monitoring commenced on 30/03/04 (9-months)
2 only three months of monitoring data due to construction works at school

Table 8.5 Annual Mean Nitrogen Dioxide Concentrations from Fife Council Monitoring Sites (μgm^{-3}) continued.

West Area	Admiralty Road, Rosyth	Admiralty Road (triplicate)			Barrie Street, Dunfermline (DUN 8N)*	Appin Crescent, Dunfermline (DUN 9N)* (triplicate)			Appin Crescent Dunfermline (1)	Appin Crescent Dunfermline (2)	High Street, Cowdenbeath
		A	B	C		A	B	C			
Type†	K	R(F)			UB	R			R(F)	R(F)	K
Easting	312103	312103			308379	309882					316523
Northing	683439	683439			688249	687713					691740
2000 (U)	38				15	33					24
2001 (U)	42				15	35					27
2002‡	36				14	34					22
2003 (U)	52				22	49					31
2003‡	42				18	40					25
2004(U)	46	23[1]	24[1]	24[1]	17	42	40[1]	39[1]	36[2]	45[3]	27
2004‡	37	19	20	20	14	35	34	33			23
2005(U)	**43**	**35**[4]	**36**[4]	**32**[4]	**16**	**38**	**40**	**40**	**33**	**47**	**26**
2005	**31**	**26**	**26**	**23**	**12**	**28**	**29**	**29**	**24**	**34**	**19**
Predicted 2010	27	23	23	20	10	24	25	25	21	30	17

† Defra classification K – Roadside, R – Roadside, UB – urban background. I – Intermediate sites are no longer used in the National network but are useful for additional local information, R(F) refers to roadside sites at the façade of buildings.
U Unbiased data
‡ Bias adjusted data using a Bias A of 0.78 for 2002 data 0.81 for 2003 and 0.84 for 2004 and 0.731 for 2005.
*Sites which are also part of the UK NO2 Network
1 monitoring commenced on 30/03/04 (9-months)
2 monitoring commenced on 03/08/04 (<6-months)
3 monitoring commenced on 31/08/04 (<6-months)
4 no date Arp/May/June – 9 months data only

Table 8.5 Annual Mean Nitrogen Dioxide Concentrations from Fife Council Monitoring Sites (μgm^{-3}) continued.

West Area	North Approach Road Kincardine (1)	North Approach Road Kincardine (2)	North Approach Road Kincardine (triplicate)			Main Street, Carnock
			A	B	C	
Type†	K	K	Co-location			K
Easting	293182	293182				304221
Northing	687530	687530				689064
2000 (U)	41					26
2001 (U)	51	52				26
2002‡	47	49				25
2003 (U)	63	60				31
2003‡	51	49				25
2004(U)	51	50	36	37	37	Discontinued
2004‡	43	42	30	31	31	
2005 (U)	**45**	**47**	**35**	**34**	**35**	
2005	**33**	**34**	**26**	**25**	**26**	
Predicted 2010	29	30	23	22	23	

† Defra classification K – Roadside, R – Roadside, UB – urban background. I – Intermediate sites are no longer used in the National network but are useful for additional local information, R(F) refers to roadside sites at the façade of buildings.
U Unbiased data
‡ Bias adjusted data using a Bias A of 0.78 for 2002 data 0.81 for 2003 and 0.84 for 2004 and 0.731 for 2005.
*Sites which are also part of the UK NO2 Network

Table 8.5 Annual Mean Nitrogen Dioxide Concentrations from Fife Council Monitoring Sites (μgm^{-3}) continued

Central Area	Esplanade Kirkcaldy	St Clair St Round-about	St Clair Street, Kirkcaldy (1)	St Clair Street, Kirkcaldy (2)	Wedderurn Road, Kirkcaldy	Redhouse Round-about, Kirkcaldy	Lovat Road, Glenrothes	North Street Glenrothes (Rothesay Place)	Dunnikier Rd Kirkcaldy
Type†	K	K	R(F)	R(F)	UB	K	K	I	R(F)
Easting	327863	329084			325288	329198	328600	327062	328152
Northing	690262	692612			693086	695281	699470	701115	692350
2000 (U)	19	25			13	26	17	15	
2001 (U)	22	26			14	32	18	19	
2002‡	20	23			13	30	18	18	
2003 (U)	27	34			19	42	24	25	
2003‡	22	28			15	34	19	20	
2004 (U)	Discontinued	discontinued	39[1]	42[1]	16	discontinued	21	discontinued	35[1]
2004‡			33	35	13		18		29
2005 (U)			**37**	**41**	**14**		**19**		**36**
2005			**27**	**30**	**10**		**14**		**26**
Predicted 2010			24	26	9		12		23

† Defra classification K – Roadside, R – Roadside, UB – urban background. I – Intermediate sites are no longer used in the National network but are useful for additional local information, R(F) refers to roadside sites at the façade of buildings.
U Unbiased data
‡ Bias adjusted data using a Bias A of 0.78 for 2002 data 0.81 for 2003 and 0.84 for 2004 and 0.731 for 2005.
*Sites which are also part of the UK NO2 Network
1 monitoring commenced on 01/04/04 (9-months)

Table 8.5 Annual Mean Nitrogen Dioxide Concentrations from Fife Council Monitoring Sites (μgm^{-3}) continued

Central Area	Victoria Rd Kirkcaldy	Glenlyon Road, Leven	Bawbee Bridge, Leven	Chapel Roundabout Kirkcaldy	Leslie Roundabout Glenrothes	Leslie High Street	Queensway Glenrothes	Adsa Roundabout, Kirkcaldy
Type†	R(F)	K	K	K	K	R(F)	K	K
Easting	328152	337357	337787	325023	326350	325111	327849	328735
Northing	692325	701318	700402	694405	701938	701806	701114	694053
2000 (U)		26	21	21	19		22	24
2001 (U)		32	25	24	20		26	27
2002‡		28	20	24	21		23	28
2003 (U)		38	29	30	29		31	39
2003‡		31	23	24	23		25	32
2004 (U)	38[1]	32	discontinued	discontinued	discontinued	29[1]	27	34
2004‡	32	27				24	23	29
2005 (U)	**40**	**32**				**27**	**26**	**32**
2005	**29**	**23**				**20**	**19**	**23**
Predicted 2010	25	20				17	17	20

† Defra classification K – Roadside, R – Roadside, UB – urban background. I – Intermediate sites are no longer used in the National network but are useful for additional local information, R(F) refers to roadside sites at the façade of buildings.
U Unbiased data
‡ Bias adjusted data using a Bias A of 0.78 for 2002 data 0.81 for 2003 and 0.84 for 2004 and 0.731 for 2005.
*Sites which are also part of the UK NO2 Network
1 monitoring commenced on 01/04/04 (9-months)

Table 8.5 Annual Mean Nitrogen Dioxide Concentrations from Fife Council Monitoring Sites (μgm^{-3}) continued

East Area	City Road, St Andrews (1N)* (duplicate)		Bell Street, St Andrews (1)	Bell Street St Andrews (2)	Market Street St Andrews	South Street, St Andrews	Windsor Gardens St Andrews (4N)*	Crossgate, Cupar
	A	B						
Type†	R		R	R(F)	R	K	UB	K
Easting	350586		350708	350716	350899	351060	349122	337538
Northing	716580		716716	716669	716744	716642	715313	714527
2000 (U)	24		27		17	19	7	23
2001 (U)	26		28		17	23	8	28
2002‡	26		30		17	19	8	27
2003 (U)	36		39		24	24	10	33
2003‡	29		32		19	19	8	27
2004 (U)	28	31[1]	29	33[1]	discontinued	discontinued	11	28
2004‡	24	26	24	28			9	24
2005 (U)	**30**	**32**	**30**	**30**			**8**	**28**[2]
2005	**22**	**23**	**22**	**22**			**6**	**20**
Predicted 2010	19	20	19	19			5	17

† Defra classification K – Roadside, R – Roadside, UB – urban background. I – Intermediate sites are no longer used in the National network but are useful for additional local information, R(F) refers to roadside sites at the façade of buildings.
U Unbiased data
‡ Bias adjusted data using a Bias A of 0.78 for 2002 data 0.81 for 2003 and 0.84 for 2004 and 0.731 for 2005.
*Sites which are also part of the UK NO2 Network
1 monitoring commenced on 02/03/04 (10-months)
2 no data Mar/Apr/May/June – monitoring for 8 months only

Table 8.5 Annual Mean Nitrogen Dioxide Concentrations from Fife Council Monitoring Sites (μgm^{-3}) continued

East Area	South Road, Cupar	Cupar Road, Auchtermuchty	Millfield, Cupar (4N)*	Bonnygate Cupar (1N)*	Bonnygate Cupar (2)	Bonnygate Cupar (3) (duplicate) A	Bonnygate Cupar (3) (duplicate) B	Bonnygate Cupar (4)
Type†	R	R	UB	R	R(F)	R(F)		R(F)
Easting	337513	324186	336867	337411	337250	337455		337440
Northing	713616	711801	713878	714572	714750	714605		714560
2000 (U)			10	30				
2001 (U)	17	27	11	29				
2002‡	15	25	12	31				
2003 (U)	21	33	16	38				
2003‡	17	27	13	31				
2004 (U)	17	32	13	34	49[1]			
2004‡	14	27	11	28	41			
2005 (U)	**18**	**32**	**13**	**31**	**51**[2]	**54**[3]	**48**[3]	**38**[4]
2005	**13**	**23**	**10**	**23**	**37**	**39**	**35**	**28**
Predicted 2010	11	20	9	20	32	34	31	24

† Defra classification K – Roadside, R – Roadside, UB – urban background. I – Intermediate sites are no longer used in the National network but are useful for additional local information, R(F) refers to roadside sites at the façade of buildings.
U Unbiased data
‡ Bias adjusted data using a Bias A of 0.78 for 2002 data 0.81 for 2003 and 0.84 for 2004 and 0.731 for 2005.
*Sites which are also part of the UK NO2 Network
1 monitoring commenced on 30/03/04 (9-months)
2 no data for Apr/Oct/Nov – 9 months monitoring only
3 monitoring commenced Mar 2005 – 10 months data only
4 Monitoring started Apr 2005 – 9 months data only

After bias adjustment by a factor of 0.731, NO_2 concentrations did not exceed $40\mu gm^{-3}$ at any location. However, measurements in Bonnygate, Cupar closely approached this value. Elevated concentrations were also recorded at Appin Crescent (2) and the kerbside site at North Approach Road, Kincardine.

All of these locations were highlighted in previous Progress Reports and the Council has been proactive in initiating a programme of further investigations.

At North Approach Road, Kincardine the roadside automatic monitor, which is more likely to reflect levels to which the public are exposed, records lower concentrations - $24\mu gm^{-3}$ annual average in 2005. In addition, as noted in the 2005 Progress Report, traffic has already reduced on this road since October 2004 (due to the opening of the Kincardine Eastern Link Road) and hence, it is anticipated that the future annual averages will be lower than currently predicted.

At Appin Crescent, the other diffusion tube monitoring locations in this street show lower concentrations. In addition, Fife Council propose more detailed monitoring at Appin Crescent. One additional diffusion tube has already been installed at this site (see Appendix 1 for location map).

The highest concentrations were recorded at Bonnygate Cupar. To investigate concentrations at this location in more detail, Fife Council have installed a new automatic monitoring site for both NO_2 and PM10. In addition, further NO_2 diffusion tube monitors were installed in 2004 and more have been installed recently (See Appendix 1 for location map).

In previous reports, Carnegie Drive, Dunfermline recorded relatively high concentrations at the kerbside site. However, concentrations have now reduced at this site and additional monitoring at the façade of buildings in this road show much lower concentrations which are well below the objective of $40\mu gm^{-3}$.

Similarly, at Admiralty Road, Rosyth, high concentrations were recorded at the kerbside site in previous years, but lower concentrations (well below $40\mu gm^{-3}$) are currently being recorded at the newly established triplicate tube at the building façade in Admiralty Road.

A clear priority for further investigation of NO_2 concentrations emerges from the diffusion tube monitoring work undertaken by Fife Council and this is being address by their current plans. The first priority is Bonnygate, Cupar and a new automatic site has already been installed at this location.

Fife Council has also recently reviewed these diffusion tube results and has installed additional monitoring sites as follows (Location maps are provided in Appendix 1):

1. Bonnygate, Cupar	Triple tube on automatic monitor Bonnygate A, B, C - 337401 714573 2 Additional single tubes – at the facade of building (Bonnygate 5- 337405 714607, Bonnygate 6 337342 714579).
2. Pittencrieff Street, Dunfermline.	Additional tube at facade of building Pittencrieff Street 1 - 308743 687549
3. St.Clair Street, Kirkcaldy	Additional tube at facade of building St Clair Street 3 - 329173 639069
4. Appin Crescent, Dunfermline	Additional tube at facade of building Appin Crescent 3 - 309975 687716

Grangemouth NO_2 Diffusion Tube Results

NPL's ambient air quality survey for Innovene in the vicinity of Grangemouth refinery[6] included NO_2. Measurements were made monthly at four sites in Fife using passive diffusion tube techniques, with analysis being conducted by Analytical Data Services Ltd on behalf of NPL. The latest data available are for the 12-month period July 2004 to July 2005. (Results from this study are only available as 12-month means starting and ending July). The results have been converted from ppb into mass units at 20^{O}C and 1 atmosphere. No data were available to enable bias correction of tubes analysed by this laboratory, so the results are presented uncorrected.

Table 8.6 NO_2 Diffusion Tube Annual Mean Concentrations (µg m^{-3}) from the NPL network

Site Code	Location	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005
16	Ford View, Cairney Hill	11	10	11	13	15	12
17	Shoreline nr. Charlestown Harbour	10	10	10	17	17	12
20	Mercer Road, Kincardine	13	11	11	15	19	13
21	Near Shoreline, Culross	8	8	10	13	13	12

The 12-month mean concentrations at these sites remain well within the AQS Objective of 40μg m^{-3}.

B. Monitoring data within AQMA

An AQMA has not been declared in Fife.

General Road Assessment

Traffic flows from the NAEI database for roads in Fife were screened with the DMRB model. Results are provided in Table 8.7.

Table 8.7 Estimated NO_2 concentrations in 2005, using DMRB, for roads included in the NAEI database.

NAEI code	Road	Distance to receptor m	AADT in 2005	Average Speed kph	Road type	Percentage HGV	Easting	Northing	Estimated Annual Mean $NO_2 \mu gm^{-3}$ in 2005
707	M90	5	31496	80	A	8.4	312800	689300	23
771	A91	5	6814	50	A	10.3	322000	710940	10
1155	A907	5	15421	50	A	7.7	308900	687600	19
1039	A90	5	70292	50	A	7.5	312600	680900	15
1046	A92	5	20872	50	A	5.6	342600	728000	16
1047	A921	5	16732	50	A	5.6	329740	694100	18
1048	A921	5	4112	50	A	5.6	321100	686000	9
1157	A909	5	3917	50	A	5.2	319500	688200	9
1159	A911	5	4616	50	A	6.4	322700	701460	9
1160	A912	5	2315	50	A	14.7	316900	710000	8
1161	A913	5	3131	80	A	11.0	335000	716500	7
1162	A915	5	15306	50	A	6.0	332000	697150	15
1163	A915	5	11684	50	A	3.6	350500	716800	11
1164	A917	5	2328	50	A	3.8	359700	706120	17
10707	M90	5	61411	80	A	6.5	312450	683800	30
10771	A91	5	11102	50	A	7.6	339300	715400	12
10772	A91	5	5590	50	A	9.2	327700	712900	9
10777	A92	5	20319	50	A	11.6	328450	701400	26
10801	A92	5	10499	50	A	8.8	328950	707200	14
10806	A985	5	12574	50	A	13.9	300000	686870	18
10857	A914	5	5571	50	A	9.3	342730	720600	10
10858	A921	5	10984	50	A	5.6	328000	690800	7
10928	A823	5	18428	80	A	5.1	309700	687330	21
10967	A907	5	25181	30	A	5.8	312900	688590	21
10973	A913	5	4828	30	A	6.6	324600	717900	8
10974	A915	5	12634	30	A	3.3	337100	701250	15
10975	A916	5	2386	30	A	10.0	335660	703500	8
10976	A917	5	3238	30	A	4.6	354600	714070	6
10993	A955	5	6918	30	A	5.4	336700	700000	14
11023	A92	5	34125	30	A	6.1	329000	699050	22
20777	A91	5	13191	30	A	5.8	350000	716900	9
20778	A91	5	9793	30	A	7.8	337000	714500	13
20779	A91	5	5844	30	A	9.7	323500	711500	10
20806	A985	5	11875	30	A	12.6	311500	683500	28
20858	A914	5	8399	30	A	5.6	334200	710000	10
20859	A921	5	4752	30	A	4.3	325000	686400	10
20928	A823	5	2789	30	A	11.9	308840	690000	9
20963	A907	5	3328	30	A	4.4	300000	690000	7
20965	A909	5	3607	30	A	12.8	315000	693900	10
20966	A910	5	11015	30	A	6.5	316450	692050	17
20967	A911	5	9819	30	A	9.0	329890	701050	16
20968	A912	5	4756	30	A	4.1	328000	705500	9
20970	A92	5	8723	30	A	9.1	340000	722800	13
20971	A915	5	1861	30	A	10.6	345000	706400	6
20972	A917	5	2449	30	A	6.0	348300	701500	6
20973	A917	5	5835	30	A	8.0	351000	716800	20
20991	A955	5	6559	30	A	4.2	330000	693000	13
21006	A994	5	10279	30	A	4.3	305000	686360	12
30707	M90	5	59013	80	A	8.7	313700	685700	27
30779	A91	5	7721	30	A	9.3	319400	709700	11
30810	A985	5	13617	30	A	5.1	305900	684700	15
30851	A90	5	59251	30	A	7.4	312340	682800	32
30858	A914	5	10105	30	A	6.1	343640	724800	12
30859	A921	5	10658	30	A	3.5	329100	692700	17
30929	A823	5	27036	30	A	4.7	310000	686400	25
30968	A907	5	14787	30	A	6.6	308980	687630	19
30970	A909	5	2283	30	A	5.8	320000	687500	9
30974	A913	5	2716	30	A	6.7	328800	718430	6
30975	A915	5	15101	30	A	4.2	334950	700000	16
30976	A916	5	3496	30	A	5.4	338500	706700	7
30977	A917	5	2519	30	A	3.9	360940	708000	5
40705	M90	5	26781	80	A	6.6	313300	694200	18
40778	A92	5	23997	30	A	8.2	328500	703700	19
40806	A985	5	14332	30	A	5.9	312000	683450	25
40859	A914	5	12067	30	A	4.4	337690	714100	12
40860	A921	5	9115	30	A	4.3	327500	688800	20
40929	A823	5	6843	30	A	8.5	309140	687770	16
40969	A909	5	6135	30	A	5.1	314000	694070	12
40971	A911	5	13123	30	A	4.6	332800	700700	14
40975	A915	5	11175	30	A	4.6	340400	702600	12
40976	A917	5	5846	30	A	4.9	344150	703240	8
40977	A917	5	6125	30	A	3.2	351650	716000	19
40995	A955	5	5609	30	A	5.5	333700	696700	11
50706	A823	5	18033	30	A	8.3	311800	684600	27
50768	A91	5	8714	30	A	7.0	343600	718800	11

NAEI code	Road	Distance to receptor m	AADT in 2005	Average Speed kph	Road type	Percentage HGV	Easting	Northing	Estimated Annual Mean $NO_2 \mu gm^{-3}$ in 2005
50774	A91	5	7425	30	A	9.4	318150	709170	12
50778	A91	5	7773	30	A	9.3	333800	713400	12
50779	A92	5	21902	30	A	6.9	328500	700000	23
50801	A985	5	12697	30	A	12.0	310000	683500	24
50807	A985	5	11215	30	A	14.2	295400	686910	19
50883	A919	5	9194	30	A	6.1	345100	721700	11
50885	A915	5	2562	30	A	5.7	349100	713300	6
50886	A921	5	35153	30	A	6.4	329400	695000	22
50888	A912	5	2966	30	A	7.0	323440	709300	7
50890	A921	5	4113	30	A	4.8	323600	686300	10
50997	A92	5	6307	30	A	9.8	331700	715200	10
74281	A907	5	6860	30	A	1.8	308260	687800	12
74282	A92	5	25463	30	A	6.8	313600	688750	23
74283	A909	5	5296	30	A	7.3	318280	689480	14
74284	A921	5	13012	30	A	3.4	328760	692450	16
74410	M90	5	59844	80	A	7.4	312310	683330	30
78537	A915	5	13743	30	A	4.2	334690	699600	16
78538	A915	5	16284	30	A	4.8	336000	701060	17
78539	A915	5	12405	30	A	4.6	338350	701720	14
78540	A916	5	5472	30	A	5.7	334930	702000	10
78545	A910	5	10573	30	A	6.5	316820	691100	18
78546	A909	5	3820	30	A	12.7	316510	692750	13
78564	A907	5	6586	30	A	1.8	307700	688310	11
78565	A823	5	6568	30	A	8.5	309080	688500	13
78590	A911	5	9633	30	A	4.5	325000	701750	14
78591	A92	5	16554	30	A	7.6	328260	702500	19
78610	A910	5	12591	30	A	3.0	324970	694500	15
78611	A955	5	5331	30	A	6.9	331280	695000	11
78621	A907	5	17946	30	A	5.5	310720	688000	19
78634	A915	5	8865	30	A	3.9	350460	716000	10
78635	A917	5	8513	30	A	2.9	352000	715550	19
78679	A90	5	56881	30	A	7.4	312310	683330	31
80084	A876	5	31807	30	A	11.5	293200	687500	24
80085	A92	5	43956	30	A	8.1	316000	690100	27
80086	A92	5	43705	30	A	8.5	324000	694350	24
80087	A92	5	26506	30	A	8.8	328000	695150	23
80088	A910	5	4431	30	A	3.9	327750	691000	3
80089	A910	5	13839	30	A	3.0	326000	692460	17
80090	A921	5	19094	30	A	3.9	315000	684100	19
80091	A977	5	21511	30	A	10.4	293150	690000	21
80092	A955	5	10008	30	A	7.7	338000	700500	15
80093	A910	5	16898	30	A	4.0	327340	691300	18
80094	A913	5	3600	30	A	15.2	326000	717075	9
80095	A911	5	18964	30	A	6.0	328000	701100	23
80096	A917	5	2119	30	A	5.6	361000	707370	5
80097	A917	5	2362	30	A	4.4	360660	708500	5
80098	A918	5	5820	30	A	8.6	351000	716600	20
80099	A907	5	22795	30	A	6.9	309500	687600	22
80100	A909	5	2455	30	A	3.9	323250	686500	9
80397	A917	5	2350	30	A	7.6	350000	700370	6
80604	M90	5	59915	80	A	9.6	313340	688180	28
80605	M90	5	25344	80	A	12.6	313740	688680	25
50882	A92	5	24225	30	A	5.6	342300	728890	25
74399	A876	5	26250	30	A	11.0	292590	687175	23

Even using a default receptor distance of 5m from the centre of the road, all roads screened do not show an exceedence of the NO_2 AQS annual average concentration of $40\mu gm^{-3}$. Maximum estimated NO_2 concentrations found close to Junction 1 of the M90.

In the previous USA report, 51 road links in Fife were screened using NAEI data and all found to have concentrations not exceeding the NO_2 annual average objective of $40\mu gm^{-3}$.

More detailed information has been received from Fife Council for this report, which includes 2 additional busy Fife Council roads (B921 and C129) and 16 Trunk Roads and Motorways. These roads have been screened using DMRB and the results are listed in Table 8.8.

The table shows that modelled NO_2 concentration at 2m of the road edge (distance from centre of link calculated as half road width + 2m) are less that $40\mu gm^{-3}$ for all of these road sections in 2005.

As this objective is not exceeded or even closely approached in 2005, the modelling has not been repeated for 2010.

Table 8.8 Estimated NO_2 concentrations in 2005, using DMRB, for busy roads in Fife, not included in the previous USA report.

Name	Description	Dist to receptor m	AADT 2005	Avg Speed kph	Road Type	% HDV	Estimated NO_2 conc 2005 μgm^{-3}
B921	Between C33 (To Auchmuirbridge) and B922 (To Cluny)	5.6	11393	75	B	8.25	22
C129	Glenrothes, Church Street	5.8	11748	40	C	11.8	25
A876 (T)	Kincardine - Between A977(T) (Toll R/A) and Kincardine Bridge	6.4	18218	40	A	12.88	28
A977 (T)	Kincardine, Feregait - Between A977(T) (Toll R/A) and Boundary North	5.7	15465	50	A	11.17	26
A977 (T)	Between A876(T) / A977(T) and Longannet Access Road	5.7	9074	62	A	15.81	24
A985 (T)	Between M90 Jct.1 (Admiralty) and A823 Rosyth, Queensferry Road	5.65	14804	45	A	11.75	27
A985 (T)	Torryburn By-Pass	6.7	11700	80	A	18.16	27
A92 (T)	E.F.R.R. Phase 1 - Between B925 (Crossgates) and A909 (Cowdenbeath)	11.3	44571	106	A	12.11	31
A92 (T)	E.F.R.R. Phase 4 - Between B981 (Chapel) & A921 (Redhouse Rdbt)	11.3	26887	103	A	13.07	30
A92 (T)	Between B921 (Bankhead Roundabout) and A921 (Redhouse Roundabout)	11.3	31508	110	A	9.29	29
A92 (T)	Between A911 (Preston Roundabout) and B921 (Bankhead Roundabout)	11.3	24179	100	A	7.4	26
A92 (T)	Between A911 (Preston Roundabout) and B969 (Balfarg Junction)	5.7	16323	78	A	12.22	27
A92 (T)	Between B938 (Ladybank South Access) and A91(T) (Melville Lodges Rdbt)	5.7	7797	87	A	9.39	21
A92 (T)	Between A913 (Parbroath Crossroads) and Rathillet	5.7	6694	90	A	9.06	21
A92(T)	Between A914 (Forgan Roundabout) and Tay Road Bridge Roundabout	5.7	18055	100	A	8.3	26
M90	Admiralty interchange	9.3	50138	110	A	11.96	32
M90	Between Junction 3 (Halbeath) and 4 (Kelty)	11.3	27625	110	A	9.28	28
A985 (T)	Kincardine Eastern Link Road	11.3	10496	75	A	16.69	25

Five busy roads screened in 2003 had estimated AADT traffic flows for 2005 which were more that 10% higher than in the 2003 USA. Increases were as follows:

A91 Cupar	12%
A911 Milton	13%
A915 Leven	29%
A91 Guardbridge	24%
A921 Bankhead interchange	14%

Table 8.9 Estimated NO_2 concentrations in 2005, using DMRB, for busy roads in Fife, with increased traffic flow.

Name	Description	Dist to receptor m	AADT 2005	Avg Speed kph	Road Type	% HDV	Estimated NO_2 conc 2005 μgm^{-3}
A91	Cupar, St.Catherine Street - Between A914 (Crossgate) and B940 (Pitscottie Rd)	7.0	13521	38	A	8.94	25
A911	Between Milton of Balgonie and B9130	5.9	11512	80	A	9.05	23
A915	Between Leven and Lundin Links	5.9	11756	70	A	11.77	24
A91	Guardbridge, St.Andrews Road - Between A919 (Main St.) & Strathkinness Rd	6	17984	60	A	5.5	23
B921	Between A92(T) (Bankhead Interchange) and Stenton Roundabout	9.16	10870	80	B	9.95	22

All of these roads remain well below the $40\mu gm^{-3}$ air quality objective for NO_2.

C. Narrow congested streets with residential properties close to kerb

In the previous USA, 23 narrow and congested streets were identified in Fife. The same streets were identified by Fife Council for this report, plus one additional location on the A91 between Dairsie Boundary West and A91 (Dairsie Roundabout).

Only one of the previously identified streets had estimated traffic flows increased by more that 10%. This was Cupar, St.Catherine Street - Between A914 (Crossgate) and B940 (Pitscottie Rd) where both the flow for 2005 and the estimated flow for 2010 were up by 12%.

Fife Council have also identified in this round of review and assessment 4 trunk roads/motorways which could also be considered as relatively narrow and congested and hence, are considered in this section.

DMRB model runs for the 6 streets identified above have been carried out and the results are presented in Table 8.10. Note that as specified in the Technical Guidance, the modelled NO_2 road increment has been doubled to provide a better estimate of NO_2 concentrations in narrow and congested streets.

Table 8.10 Estimated NO_2 concentrations in 2005, using DMRB, for Narrow and Congested streets in Fife which were not included in previous reports.

Name	Description	Dist to receptor m	AADT 2005	Avg Speed kph	Road Type	% HDV	NOx back-ground μgm^{-3}	NO_2 back-ground μgm^{-3}	NO_2 road traffic contribution μgm^{-3}	Estimated NO_2 conc 2005 μgm^{-3}
A91	Between Dairsie Boundary West and A91 (Dairsie Roundabout)	5.24	10519	50	A	19.3	18.5	15.6	11.2	38
A91	Cupar, St.Catherine Street - Between A914 (Crossgate) and B940 (Pitscottie Rd)	7.0	13521	48	A	8.94	18.5	15.6	8.6	33
A876 (T)	Kincardine – Between A977(T) (Toll R/A) and Kincardine Bridge	6.4	18218	40	A	12.88	18.5	15.6	12.8	41
A977 (T)	Kincardine, Feregait - Between A977(T) (Toll R/A) and Boundary North	5.65	15465	50	A	11.17	18.5	15.6	10.8	37
A977(T)	Between A876(T) / A977(T) and Longannet Access Road	5.72	9074	62	A	15.81	18.5	15.6	8.5	33
A985 (T)	Between M90 Jct.1 (Admiralty) and A823 Rosyth, Queensferry Road	5.65	14804	45	A	11.75	18.5	15.6	11.1	38

Table 8.10 shows that DMRB modelling at these location for receptors 2m from the kerb indicates NO_2 concentrations below $40\mu gm^{-3}$ except for the A876(T) in Kincardine. However, this road has been identified previously as likely to experience high NO_2 concentrations and hence, Fife Council installed an automatic NO_2 monitor on this street. The results from this monitor (Section 8.4.3 (A)) show that no exceedence of the NO_2 Air Quality Objective actually occurs at this site. Hence, no further assessment is required at this location.

As modelled NO_2 concentrations for 2005 are mostly well below $40\mu gm^{-3}$ the modelling has not been repeated for 2010.

D. Junctions

Detailed information on intersecting roads in Fife has been supplied by the Council for this report. All identified junctions were screened using DMRB with the receptor distance and background concentrations as defined earlier. A default annual average speed at the junction has been taken as 30kph, except on motorways where the traffic flow is not interupted by the junction. Where this initial screening indicated possible exceedences of the Air Quality Objective for NO_2, Fife Council rechecked these junctions and determined actual distances from the road centre to the nearest receptor. The modelling was then repeated with these distances and the updated results are presented in Table 8.11.

Table 8.11 Estimated NO_2 concentrations in 2005, using DMRB,

for busy road junctions in Fife

Code	Name	Description	Dist to receptor m	AADT 2005	Avg Speed kph	Road Type	% HDV	Estimated NO_2 conc 2005 μgm^{-3}
A	A907	Dunfermline, Carnegie Drive - Bet. A823 (Pilmuir St) & A823 (St.Margarets Drive)	30	22249	30	A	18.9	29
	A823	Dunfermline, St.Margarets Drive - Between Bothwell Gdns and Sinclair Gdns	74	21678	30	A	9	
B	A907	Dunfermline, Rumblingwell - Between William Street & Boundary North-West	5.3	10948	30	A	6.6	27
	B9155	Dunfermline, Baldridgeburn - Between A907 (William St) & A823 (Arthur St)	6.235	9748	30	B	9.96	
C	A909	Cowdenbeath, High Street - Between Broad Street and B981 (Lumphinnans Rd)	4.795	14818	30	A	9.68	31
	B981	Between A909 (Kelty Junction Rdbt) and B920 (Lochgelly, Lumphinnans Road)	5.36	10198	30	B	9.84	
D	A910	Kirkcaldy, Forth Avenue - Between Oriel Road and Abbotshall Road	5.535	12842	30	A	4.4	28
	A910	Kirkcaldy, Oriel Road - Between Strathallan Drive and Forth Avenue	5.57	14522	30	A	4.46	
E	A910	Kirkcaldy, Forth Avenue - Between Oriel Road and Abbotshall Road	5.535	12842	30	A	4.4	32
	A910	Kirkcaldy, Abbotshall Road - Between B925 (Boglily Road) and Forth Avenue	6.12	17714	30	A	10.75	
F	A919	Guardbridge, Main Street - Between A91 and Boundary North	5.565	11594	30	A	14.01	33
	A91	Guardbridge, St.Andrews Road - Between A919 (Main St.) & Strathkinness Rd	6.025	17984	30	A	5.5	
G	A955	Leven, Scoonie Rd./Durie St. - Between Shorehead & A915 (Scoonie Rdbt)	5.065	10754	30	A	8.34	33
	A915	Leven - Between A955 (Scoonie Roundabout) and B927 (Cupar Road)	6.45	14167	30	A	11.64	
H	A911	Between A915 (Durie Vale Roundabout) and Windygates West Access	6.495	11374	30	A	8.01	33
	A915	Windygates By-Pass - Bet. A911 (Durie Vale Rdbt) & B932 (Cameron Rdbt)	6.69	19933	30	A	9.6	
I	A914	Between A919 (St.Michaels) and A914 (Forgan Roundabout)	6.42	11593	30	A	5.5	30
	A92(T)	Between A914 (Forgan Roundabout) and Tay Road Bridge Roundabout	9.3	18055	30	A	8.3	
J	A911	Glenrothes - Between Rothes Road and Western Avenue (Leslie Roundabout)	5.64	17713	30	A	8	31
	B969	Glenrothes, Leven Bridge (Leslie Roundabput to South Parks)	6.005	11255	30	B	8	
K	A921	Between M90 Jct.1 (Admiralty) and B981 (Inverkeithing)	22.5	21249	30	A	9.22	25
	A985(T)	Between M90 Jct.1 (Admiralty) and A823 Rosyth, Queensferry Road	22.5	14804	30	A	11.75	
	M90	Admiralty interchange	22.5	50138	110	A	11.96	
L	A907	Dunfermline - Halbeath Road, Between M90 Jct.3 and Whitefield Road	33	26109	30	A	8.55	23
	A92(T)	E.F.R.R. Phase 1 - Between B925 (Crossgates) and A909 (Cowdenbeath)	33	44571	30	A	12.11	
	M90	Between Junction 3 (Halbeath) and 4 (Kelty)	33	27625	110	A	9.28	
M	A910	Between A92(T) (Chapel Interchange) and Chapel Roundabout	6.76	23952	30	A	6.86	37
	A92(T)	E.F.R.R. Phase 4 - Between B981 (Chapel) & A921 (Redhouse Rdbt)	11.3	26887	30	A	13.07	
N	A994	Between Cairneyhill and A985(T) (Torryburn Roundabout)	5.465	9679	30	A	11.92	35
	A985(T)	Torryburn By-Pass	6.65	11700	30	A	18.16	
O	A823	Dunfermline - Between B916 (Aberdour Rd) & B9156 (Bothwell Gdns)	6.975	27711	30	A	15.17	38
	B9156	Dunfermline, Nethertown Broad Street - Between A823 and Coal Road	7.85	15306	30	B	6.6	
P	A915	Between A911 (Durie Vale Roundabout) and B933 (Leven, Glenlyon Road)	5.735	14002	30	A	8.73	32
	B933	Leven, Glenlyon Road - Between A915 and Riverside Road	5.77	11405	30	B	9.23	
Q	A911	Glenrothes, Queensway - Between A92(T) (Preston Rdbt) and Rothes Road	9.29	22585	30	A	8.3	34
	A92(T)	Between A911 (Preston Roundabout) and B921 (Bankhead Roundabout)	11.3	24179	30	A	7.4	
R	A911	Glenrothes, Queensway - Between A92(T) (Preston Rdbt) and Rothes Road	9.29	22585	30	A	8.3	32
	C129	Glenrothes, Church Street	5.75	11748	30	B	11.8	
S	A921	Between A92(T) (Redhouse Roundabout) and A915 (Gallatown Roundabout)	9.82	31794	30	A	9.28	34
	B981	Kirkcaldy, Dunnikier Way - Between Hendry Road and Whytemans Brae	7.12	18948	30	B	7	
T	A921	Between A92(T) (Redhouse Roundabout) and A915 (Gallatown Roundabout)	9.82	31794	30	A	9.28	37
	A92(T)	Between B921 (Bankhead Roundabout) and A921 (Redhouse Roundabout)	11.3	31508	30	A	9.29	

Code	Name	Description	Dist to receptor m	AADT 2005	Avg Speed kph	Road Type	% HDV	Estimated NO_2 conc 2005 μgm^{-3}
U	A907	Dunfermline, Halbeath Rd - Between B912 & A823 (Sinclair Gdns)	5.85	20167	30	A	6.16	29
	B912	Dunfermline, Whitefield Road - South of Hospital Access	5.73	13048	30	B	5.11	
V	B921	Between A92(T) (Bankhead Interchange) and Stenton Roundabout	9.16	10870	30	B	9.95	32
	A92(T)	Between B921 (Bankhead Roundabout) and A921 (Redhouse Roundabout)	11.3	31508	30	A	9.29	
W	B921	Between A92(T) (Bankhead Interchange) and Stenton Roundabout	9.16	10870	30	B	9.95	26
	B969	Glenrothes, Rothes Road - Bet. South Parks Road and B921 (Stenton)	7.19	11583	30	B	5.25	
X	A876(T)	Kincardine - Between A977(T) (Toll R/A) and Kincardine Bridge	6.4	18218	30	A	12.88	37
	A985(T)	Kincardine Eastern Link Road	7.475	10496	30	A	16.69	
NC/A	A907	Dunfermline, Rumblingwell - Between William Street & Boundary North-West	5.3	10948	30	A	6.6	27
	B9155	Dunfermline, Baldridgeburn - Between A907 (William St) & A823 (Arthur St)	6.2	9748	30	B	9.96	
NC/B	A909	Cowdenbeath, High Street - Between Broad Street and B981 (Lumphinnans Rd)	4.8	14818	30	A	9.68	31
	B981	Between A909 (Kelty Junction Rdbt) and B920 (Lochgelly, Lumphinnans Road)	5.4	10198	30	B	9.84	
NC/C	A910	Kirkcaldy, Forth Avenue – Between Oriel Road and Abbotshall Road	5.5	12842	30	A	4.4	32
	A910	Kirkcaldy, Abbotshall Road - Between B925 (Boglily Road) and Forth Avenue	6.12	17714	30	A	10.75	

Table 8.11 shows that there are no predicted exceedences of the NO_2 Air Quality Objective of $40\mu gm^{-3}$ as an annual average.

E. Busy streets where people may spend 1 hour or more close to the kerb

In the previous USA, 11 busy streets where people may spend more that one-hour close to the kerb were identified. Use of the DMRB screening model indicated that none of these streets would exceed the $40\mu gm^{-3}$ annual average Air Quality Objective for NO_2.

In 2006, the same 11 streets were identified, but separate traffic estimates were available for the A994 through Cairneyhill and Crossford villages, whereas these had been covered by a single traffic estimate previously. The traffic estimate for Crossford village was 17% higher than the previous estimate. However, DMRB modelling using the new estimated traffic flows and the same parameters as used in other sections of this report showed no expected exceedence of the $40\mu g/m^3$ annual Air Quality Objective for NO_2 – see Table 8.12.

Table 8.12 Estimated NO_2 concentrations in 2005, using DMRB, for busy roads where people may spend 1hr close to the kerb

Name	Description	Dist to receptor m	AADT 2005	Avg Speed kph	Road Type	% HDV	Estimated NO_2 conc 2005 $\mu mg/m^3$
A994	Crossford village	5.8m	12677	50	A	10.33	25

F. Roads with high flows of buses and/or HGV's

In the previous USA report, Market Street Dunfermline was identified as a road with an unusually high proportion of HGV vehicles (67%). However, the total traffic flow was low at about 2500 vehicles per day and hence, DMRB modelling indicated no exceedence of the NO_2 objective. The same road is identified this time, but it is noted that there is a junction between this road and the busy (22249 veh/day) Carnegie Drive. Hence, DMRB modelling has been repeated to check the combined effect of both roads. Using the same parameters as in previous DMRB modelling in this report – but not multiplying the contribution by 2 as the roads are not identified as narrow and congested – the total estimated NO_2 concentration in 2005 is approximately $33\mu gm^{-3}$ and hence well below the Air Quality Objective. (See Table 8.13)

One additional road with a high HGV component was identified – Rosyth Port Access. However, this had a very low total flow of 1647 veh/day and DMRB modelling indicated an annual average NO_2 concentration of only $13\mu gm^{-3}$. (See Table 8.13)

Table 8.13 Estimated NO_2 concentrations in 2005, using DMRB,

for Roads with high HGV flows.

Name	Description	Dist to receptor m	AADT 2005	Avg Speed kph	Road Type	% HDV	Estimated NO_2 conc 2005 $\mu g/m^3$
A907	Dunfermline, Carnegie Drive	9.74	22249	40	A	18.9	36
N/A	Dunfermline, Market Street	5.8	2530	40	B	66.8	
N/A	Rosyth Port Access	5.8	1647	40	A	64.78	22

G. New roads constructed or proposed since the previous round of Review and Aseeseement

During 2004, the Kincardine Eastern Link road was opened. This road has been included in the assessment of general roads in Table 8.8 above. Modelled NO_2 concentrations from this road are well below $40 \mu gm^{-3}$.

H. Roads with significantly changed traffic flows, or new relevant exposure

Modelling of roads with increased traffic flow has been included in the appropriate sections above. No roads with increased traffic flow are estimated to exceed to air quality objective for NO_2.

I. Bus stations

Information was provided by Fife Council on 6 Bus Stations – Dunfermline, Glenrothes, Kirkcaldy, Leven, St Andrews and Ferrytoll. The maximum number of departures was 5910 per week (at Dunfermline) and hence, no bus station exceeded the threshold of 1000 bus movements per day.

J. New industrial sources

SEPA have provided updating information on industrial installations in Fife (covered by the Stirling and Glenrothes teams) relating to changes that have been introduced since May 2005. Changes between the date of issue of the previous USA in 2003 and May 2005 have been covered in the 2 intervening progress reports.

SEPA have identified the following changes to Part A or B processes that will result in a positive or negative effect on the local air quality:

- Negative changes: Tullis Russell will be changing from burning gas to using another coal fired boiler
- Positive Changes: Silberline PPC\E\20036, instalment and operation of Abatement system for VOCs

At Tullis Russell, SEPA confirm that the operator has already carried out a detailed modelling assessment of the Tullis Russell site that has considered the emissions of particulate material, SO_2, NOx and CO. SEPA is currently discussing the results of this modelling assessment with the operator and will provide Fife Council with details of this assessment once it has been agreed with the operator.

In addition, United Glass in Alloa are now permitted to use heavy fuel oil as well as natural gas.

Two new PPC permits have been issued for Fife, a Part B for the coating process at FMC, Pitreavie Business Park, Dunfermline (solvent consumption exceeded threshold) and a Part A Inorganic Chemical process at Lexmark, Rosyth. Both these installations were existing but are new to regulation under PPC. SEPA have confirmed that there will be no major change to emissions from these processes, although the VOC emissions from FMC are likely to have increased proportionately with increased production.

Scottish Power Generation Ltd have recently applied for a permit under the Pollution Prevention and Control Regulations which includes the application of flue gas desulphurisation to three of the 4 main vent stacks from Longannet Power Station. The fourth vent will continue to operate using low sulphur fuel as SO_2 abatement method. The Permit Application states that " the measured and modelled releases of SO_2, NOx and particulates from Longannet Power Station at the point of maximum impact are below Air Quality Strategy targets for 2004/5 and the particulate matter targets up to 2010."

The following Part A or B processes in Fife have ceased to operate:

Lynebank Service Station PVR, Halbeath Road Dunfermline
Halbeath Petrol Station PVR, Halbeath Road, Dunfermline
Kingdom Services PVR
Fentons Meadowhill Open Cast Coal Site - actually in Clackmannanshire, but may impact on air quality in Fife
Buko, Glenrothes, PPC\E\20074
Forbo Nairns, Kirkcaldy, PPC\E\20037
Part B: Nationwide, Kirkcaldy, APC\E\464
Randolf Paintshop, Kirkcaldy, APC\E\20069
Forth Ports Coal Handling, Methil, APC\E\431

There are no new petrol stations with an annual throughput of over 2000 cubic metres of petrol.

There are no new mineral extraction processes that are likely to have a significant impact on the local air quality.

SEPA have confirmed that there are no other sources they would like to see included in the Council's assessment.

K. Industrial sources with substantially increased emissions or new relevant exposure
The only SEPA regulated process that has increased its emissions to air by more than 30% will be Tullis Russell when the coal fired boiler commences operation – this is discussed in the Section J above.

l. Aircraft
There are no major airports in Fife and Edinburgh Airport in a neighbouring authority is 7km from the nearest boundary with Fife and hence its contribution to NO_2 concentrations within Fife is considered to be negligible.

8.5 CONCLUSION FOR NITROGEN DIOXIDE

The automatic and diffusion tube monitoring undertaken by Fife Council indicate that the annual average air quality objective for NO_2 will not be exceeded in Fife. However, a clear priority for further investigation of NO_2 concentrations emerges from the diffusion tube monitoring work undertaken by Fife Council. The NO_2 air quality objective is approached at two locations where NO_2 diffusion monitoring is being undertaken – Bonnygate Cupar and Appin Crescent, Dunfermline. Concentrations are marginally higher at Bonnygate Cupar and hence this first priority for additional monitoring. The Council has already installed a new automatic monitoring site at this location and is in the process of installing additional diffusion tube monitoring sites to better define the area of high concentration.

Screening of roads and junctions throughout Fife indicated that there was unlikely to be any exceedence of the NO_2 objective.

There are no industrial processes or planned developments that are likely to lead to an exceedence of the NO_2 objective.

9 Sulphur dioxide (SO_2)

9.1 THE NATIONAL PERSPECTIVE

The main source of sulphur dioxide in the United Kingdom is power stations, which accounted for 69% of emissions in 2004. There are also significant emissions from other industrial combustion sources. Emissions from domestic sources fell by 34% in 2002-2003, but these can still have a significant effect locally. Road transport currently accounts for less than 1% of emissions.

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

9.2 STANDARD AND OBJECTIVE FOR SULPHUR DIOXIDE

Within the UK, a 15-minute mean of 266 μgm^{-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 has been adopted.

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 μgm^{-3}, to be exceeded no more than 24 times per year, and a 24-hour objective of 125 μgm^{-3}, to be exceeded no more than 3 times per year, to be achieved by the end of 2004.

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

Data reported in the Updating and Screening Report and the two annual Progress Reports indicate that the Air Quality Objective for sulphur dioxide is unlikely to be exceeded.

9.4 SCREENING ASSESSMENT OF SULPHUR DIOXIDE

9.4.1 Screening checklist

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

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

These are evaluated in the following sections.

9.4.2 Background concentration for Sulphur Dioxide

The estimated annual average and maximum background SO_2 concentrations in Fife are 2$\mu gm^{-3}$and 20μgm^{-3} respectively.

The location of the maximum concentration is just to the north of Longannet power station.

9.4.3 Screening assessment

A. Monitoring data outside AQMA

Automatic SO_2 Data
Results for the monitoring period December 2004 and August 2005 for the continuous monitoring site at Admiralty Rd, Rosyth are provided in Table 9.1.

Table 9.1 Automatic Monitoring Data from Admiralty Rd, Rosyth (µg m^{-3})

Period	Max. 15 minute Mean (µgm^{-3})	Max. 1-hour Mean (µgm^{-3})	Max. 24-hour Mean (µgm^{-3})
December 2004 – August 2005	176	119	18
AQS Objective	266 (max. 35 exceedences)	350 (max. 24 exceedences)	125 (max. 3 exceedences)

The maximum 15-minute, 1-hour, and 24-hour mean SO_2 concentrations at Admiralty Rd, Rosyth were well within the relevant AQS objectives for the 9-month monitoring period at this site. Hence, it is unlikely that any of the Air Quality Objectives for SO_2 will be exceeded over a full calendar year at this site.

Sulphur dioxide monitoring is also undertaken on behalf of Longannet Power Station[9] at Blair Mains (Grid Reference NS972864) to the north east of the power station. Results for 2005 for this site are provided in Table 9.2

Table 9.2 Automatic Monitoring Data from Blair Mains, Fife (µg m^{-3})

Period	Max. 15 minute Mean (µgm^{-3})	Max. 1-hour Mean (µgm^{-3})	Max. 24-hour Mean (µgm^{-3})
2005	129	74	Not available
AQS Objective	266 (max. 35 exceedences)	350 (max. 24 exceedences)	125 (max. 3 exceedences)

The table shows that there were no exceedences of the 15min or 1-hour Air Quality Objectives for SO_2. The maximum daily value recorded at the site is not available, but the 99.18th percentile of daily values was 21µgm^{-3} and hence, the daily objective was also not exceeded.

Data from the National Smoke and SO_2 Network
Two sites in Fife were part of the Smoke and SO_2 network- this network ceased operation at the end of 2005. The sites in Fife were at Broad Street Primary School, Cowdenbeath (COWDENBEATH 1) and at Templehall Community Centre, Kirkcaldy (KIRKCALDY 6). These sites monitor net acidity as SO_2 equivalent. The site at Templehall ceased in April 2005 and hence the data are not used in this report. The monitoring site at Cowdenbeath ceased in operation in April 2006.

The maximum measured daily mean during 2005 at the Cowdenbeath Site was 27µg m^{-3}. The net acidity method typically overestimates SO_2 concentrations: however, it is understood that at high concentrations it may be subject to increased uncertainty: to allow for this, the maximum daily concentration should be multiplied by a factor of 1.25 when comparing with objectives. These non-automatic sites produce 24-hour mean results, so the data are not directly comparable with AQS objectives relating to the 1-hour or 15-minute mean. However, following the guidance document LAQM TG(03)[1] Chapter 7, it is possible to estimate the 99.7th percentile of one hour means, and 99.9th percentile of 15 minute means, for comparison with the air quality objectives. As stated in The Guidance these are based on an empirical relationship between the maximum daily mean. These data are given in Table 9.3.

Table 9.3 SO_2 Concentrations for 2004 from Smoke and SO_2 sampling stations in Fife (µg m^{-3})

	Broad Street, Cowdenbeath
Data Capture	83%
Annual Mean	13
Maximum Daily Value	27
Corrected Maximum daily value (use of uncertainty factor)	34
Estimated 99.9th percentile of 15-minute means	64
Estimated 99.7th percentile of 1-hour means	47

The maximum daily values at both sites were well below the AQS objective for the 24-hour mean. The estimated 99.9th percentile of 15-minute means was well below the AQS objective of 266µgm^{-3}, and the estimated 99.7th percentile of 1-hour means was well below the AQS objective of 350µg m^{-3}. It is evident that the air quality objectives are unlikely to be exceeded at this monitoring site.

SO_2 Diffusion tubes

Although SO_2 diffusion tube data are not considered sufficiently accurate for inclusion in the Review and Assessment process, the following are included for completeness and to provide a broad indication of air quality. Diffusion tubes were deployed by both Fife Council, and by NPL as part of their survey on behalf of BP Oil. The NPL averaging period is from July to July.

The monitoring sites operated by Fife Council are close to the Tullis Russell papermill and will help to assess any changes in emissions due to the proposed change from burning gas to using another coal fired boiler (see section C below).

Table 9.4 Fife Council SO_2 Concentration (µg m^{-3}) by Diffusion tube

	Main Street Culross	Valleyfield Dunfermline	Mount Frost Drive Markinch (1)	Mount Frost Drive Markinch (2)	Mount Frost Drive Markinch (3)
2003	4	-			
2004	4	4[1]	16[2]	11[2]	9[2]
2005	4	4	7	9	7

1 - 03/08/04 – 30/11/04 only
2 – from 03/08/04

Table 9.5 NPL SO_2 Concentration (µg m^{-3}) by Diffusion tube

	Ford View, Cairney Hill Site 16	Shoreline nr. Charlestown Harbour Site 17	Mercer Road, Kincardine Site 20	Near Shoreline, Culross Site 21
Jul 2002 – Jul 2003	3	8	5	5
Jul 2003 – Jul 2004	3	8	3	3
Jul 2004 – Jul 2005	3	6	3	3

The Air Quality Strategy includes an objective of 20 μgm^{-3} for the annual and winter mean SO_2 concentration, for protection of ecosystems, which is applicable only in rural areas. This may be applicable to NPL's two shoreline sites at Charlestown and Culross. The 12-month mean at all sites is well within this objective.

B. Monitoring data within AQMA

An AQMA has not been declared in Fife.

C. New industrial sources

SEPA have provided updating information on industrial installations in Fife (covered by the Stirling and Glenrothes teams) relating to changes that have been introduced since May 2005. Changes between the date of issue of the previous USA in 2003 and May 2005 have been covered in the 2 intervening progress reports.

SEPA have identified the following changes to Part A or B processes that will result in a positive or negative effect on the local air quality:

- Negative changes: Tullis Russell will be changing from burning gas to using another coal fired boiler
- Positive Changes: Silberline PPC\E\20036, instalment and operation of Abatement system for VOCs

At Tullis Russell, SEPA confirm that the operator has already carried out a detailed modelling assessment of the Tullis Russell site that has considered the emissions of particulate material, SO_2, NOx and CO. SEPA is currently discussing the results of this modelling assessment with the operator and will provide Fife Council with details of this assessment once it has been agreed with the operator.

In addition, United Glass in Alloa are now permitted to use heavy fuel oil as well as natural gas.

Two new PPC permits have been issued for Fife, a Part B for the coating process at FMC, Pitreavie Business Park, Dunfermline (solvent consumption exceeded threshold) and a Part A Inorganic Chemical process at Lexmark, Rosyth. Both these installations were existing but are new to regulation under PPC. SEPA have confirmed that there will be no major change to emissions from these processes, although the VOC emissions from FMC are likely to have increased proportionately with increased production.

Scottish Power Generation Ltd have recently applied for a permit under the Pollution Prevention and Control Regulations which includes the application of flue gas desulphurisation to three of the 4 main vent stacks from Longannet Power Station. The fourth vent will continue to operate using low sulphur fuel as SO_2 abatement method. The Permit Application states that " the measured and modelled releases of SO_2, NOx and particulates from Longannet Power Station at the point of maximum impact are below Air Quality Strategy targets for 2004/5 and the particulate matter targets up to 2010."

The following Part A or B processes in Fife have ceased to operate:
Lynebank Service Station PVR, Halbeath Road Dunfermline
Halbeath Petrol Station PVR, Halbeath Road, Dunfermline
Kingdom Services PVR
Fentons Meadowhill Open Cast Coal Site - actually in Clackmannanshire, but may impact on air quality in Fife
Buko, Glenrothes, PPC\E\20074
Forbo Nairns, Kirkcaldy, PPC\E\20037
Part B: Nationwide, Kirkcaldy, APC\E\464
Randolf Paintshop, Kirkcaldy, APC\E\20069
Forth Ports Coal Handling, Methil, APC\E\431

SEPA have confirmed that there are no other sources they would like to see included in the Council's assessment.

D. Industrial sources with substantially increased emissions or new relevant exposure
The only SEPA regulated process that has increased its emissions to air by more than 30% will be Tullis Russell when the coal fired boiler commences operation – this is discussed in the Section C above.

E. Area of domestic coal burning
The 2003 Updating and Screening assessment report identified 5 areas where the estimated number of households using coal per $500m^2$ was greater than 100 and recommended that fuel use surveys be carried out. However, when Fife Council subsequently undertook a fuel use survey in one area identified (Crossgates) only 3 solid fuel appliances were found. In view of this, and there being no other evidence of SO_2 concentration issues, no further fuel use surveys have been carried out.

F. Small boilers > 5MW(thermal)
No new boiled plant have been identified since the previous review and assessment report

G. Shipping

There are no significant changes to report since the last Updating and Screening Assessment report of August 2003.

H. Railway locomotives
There are no significant changes to report since the last Updating and Screening Assessment report of August 2003.

In addition, the 2005 Progress Report provided information that:

> No new locations have been identified where trains are stationary with engines running for more than 15 mins.
>
> Scotrail has specific instructions related to diesel locomotive emissions. There is a "no idling policy" whereby, if the driver is informed by the signaller that the train is to remain stationary for more than 15 minutes the locomotive engine shall be shut down. The signaller will then phone the driver 5 minutes prior to the departure time so the driver can restart the locomotive. In addition, ScotRail's DMU fleet is designed to save fuel by closing down engines automatically if they are idling for more than fifteen minutes
>
> It is also ScotRail's policy (Engineering Document MP/DMU/SC/0017) to test the exhaust emissions of all its DMU fleet on an annual basis to ensure engine efficiency (using a Sun ASA 200 Diesel Engine Exhaust Emission Test Unit). Records of any work done and emission test results are formally retained for each vehicle. All new or reconditioned engines being purchased by ScotRail shall comply with the emission test. Every opportunity is taken to remove any non-compliant engine from the supply line.
>
> No other train operator (i.e. Virgin, GNER) have engines stationary for 15 mins, within Fife

9.5 CONCLUSION FOR SULPHUR DIOXIDE

On the basis of the monitoring data and the assessment of industrial emissions, Fife Council is not required to carry out a detailed assessment for sulphur dioxide.

10 PM_{10}

10.1 THE NATIONAL PERSPECTIVE

National UK emissions of primary PM_{10} have been estimated as totalling 141,000 tonnes in 2003. Of this total, around 27% was derived from road transport sources. It should be noted that, in general, the emissions estimates for PM_{10} 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 PM_{10} in the UK and current and future ambient concentrations. APEG concluded that a significant proportion of the current annual average PM_{10} 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 PM_{10} above 100 $\mu g\ m^{-3}$ associated with poor dispersion. However, it is clear that many of the sources of PM_{10} are outside the control of individual local authorities and the estimation of future concentrations of PM_{10} are in part dependent on predictions of the secondary particle component.

10.2 STANDARD AND OBJECTIVE FOR PM_{10}

Throughout the UK, two Air Quality Objectives for fine particles (PM_{10}), have been adopted which are equivalent to the EU Stage 1 limit values in the first Air Quality Daughter Directive. The objectives are 40 μgm^{-3} as the annual mean, and 50 μgm^{-3} as the fixed 24-hour mean to be exceeded on no more than 35 days per year, to have been achieved by the end of 2004. In addition, in Scotland there is an objective of 50 μgm^{-3} as the fixed 24-hour mean to be exceeded on no more than 7 days per year and 18μgm^{-3} as the annual mean to be achieved by the end of 2010. The objectives are based upon measurements carried out using the European gravimetric transfer reference sampler or equivalent.

10.3 CONCLUSIONS OF THE SECOND ROUND OF REVIEW AND ASSESSMENT FOR PM_{10}

The 2003 USA indicated that there was little risk of the 40$\mu g\ m^{-3}$ annual average objective for PM10 in Fife.

The 2004 Progress Report recommended that longer duration PM10 monitoring be undertaken. This has been addressed by a 6-month monitoring programme at Admiralty Road, Rosyth. Though the 2004 Progress Report recommended that further PM_{10} monitoring also be carried out at Tulliallan School subsequent information indicated that other sites were of higher priority. Hence, Fife Council have installed an additional PM_{10} automatic monitoring site at Bonnygate, Cupar.

10.4 SCREENING ASSESSMENT OF PM_{10}

10.4.1 Checklist for PM_{10}

The Technical Guidance LAQM TG(03)[2] requires assessment of PM_{10} to consider the following sources, data or locations:

- Monitoring data outside an AQMA
- Monitoring data within an AQMA
- Busy roads and junctions in Fife
- Junctions
- Roads with high flow of buses and/or HGVs

- New roads constructed or proposed since last round of review and assessment
- Roads with significantly changed traffic flows, or new relevant exposure
- Roads close to the objective during the last round of review and assessment
- New industrial sources
- Industrial sources with substantially increased emissions, or new relevant exposure
- 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.

10.4.2 Background concentrations for PM_{10}

The estimated annual average and maximum background PM_{10} concentrations in Fife for 2005 and 2010 are shown in Table 10.1.

Table 10.1 Annual average and maximum background PM10 concentrations in Fife for 2005 and 2010

	PM_{10}	
	Average μgm^{-3}	Maximum μgm^{-3}
2005	11.8	16.8
2010	11.1	15.6

The location of the maximum concentration for PM_{10} in 2005 was in the 1km square containing the A90 Northern approach road to the Firth Road Bridge. In 2010 two squares had equal maximum concentrations – the same square as in 2005 and a square containing the A823(M) close to its junction with the M90 south of Dunfermline.

For the purposes of DMRB modelling of PM_{10} concentrations for the data supplied by Fife Council, a background 1*1km square covering a residential area of Glenrothes has been selected. The grid reference of the centre of this square is 327500,700500 and the estimated background concentration for PM_{10} 2005 was 15.1μgm^{-3} and 14.2μgm^{-3} for 2010.

10.4.3 Screening assessment

A. Monitoring data outside AQMA

Automatic PM_{10} Data from Admiralty Rd, Rosyth

PM_{10} monitoring commenced at Admiralty Road, Rosyth (as part of the "Groundhog" monitoring facility) during November 2004 and continued until August 2005. Hence, monitoring data a 9-month period are available and are summarised in Table 10.2. The monitoring facility is operated by Dundee City Council Scientific Services on behalf of Fife Council.

Table 10.2 Automatic PM_{10} Monitoring data (Gravimetric Equivalent) – Admiralty Rd, Rosyth

Period	Scaling factor to gravimetric units	Mean Period Concentration ($\mu g\ m^{-3}$)	Exceedences of 24-hour objective	Max. 24-hour mean ($\mu g\ m^{-3}$)
Dec 2004 – Aug 2005	1.3	19	Not available	59
	1.14	17	-	-

This monitoring therefore indicates that concentrations at this site are well below the PM_{10} Air Quality objectives for 2004. Projecting the annual mean concentration forward to 2010, using the methodology of Box 8.6 in the Technical Guidance indicates an annual average concentration of 18μgm^{-3} or 16μgm^{-3} based on gravimetric scaling factors of 1.3 or 1.14 respectively.

As this indicates that the 2010 Air Quality Objective for PM_{10} may be closely approached at this site, Fife Council propose to carry out a further 6-months of monitoring at this location, commencing towards the end of 2006.

Automatic PM_{10} data from Bonnygate, Cupar

Monitoring of PM_{10} at a site in Bonnygate, Cupar commenced on 19 December 2005. Unfortunately however, monitoring could not be undertaken during the period 6 February 2006 to 15 March 2006 because the power supply was interrupted by road works. Hence, as of mid April 2006 approximately 3-months of data are available covering a 4-month period. These data have not been ratified, but for this period the average PM_{10} concentration was 26μgm^{-3} or 22.8μgm^{-3} based on gravimetric scaling factors of 1.3 or 1.14 respectively. This projects forward to an estimated concentration for 2010 of 24μgm^{-3} or 21μgm^{-3} based on gravimetric scaling factors of 1.3 or 1.14 respectively. Hence, the PM_{10} air quality objective for 2010 may be exceeded at this site. However, monitoring for the full year of 2006 is required to confirm this. In addition, it should be noted that the monitor is situated close to the kerb and not at the façade of buildings which would be a more appropriate location for PM_{10} exposure – this location had to be selected because of difficulties with access restrictions at this site.

B. Monitoring data within AQMA

An AQMA has not been declared in Fife.

C. Busy roads and junctions in Fife

Traffic flows from the NAEI database for roads in Fife were screened with the DMRB model using default parameters. The results are provided in Table 10.3.

Table 10.3 Estimated PM10 concentrations in 2005, using DMRB, for roads included in the NAEI database.

NAEI code	Road name	Distance to receptor m	AADT in 2005	Average Speed kph	Road type	Percentage HGV	Easting	northing	Estimated Annual Mean PM10 in 2005 μgm^{-3}	24hour mean exceedence in 2005
707.0	M90	5	31496.4	80	A	8.4	312800	689300	19	2
771.0	A91	5	6814.5	50	A	10.3	322000	710940	13	0
1155.0	A907	5	15420.6	50	A	7.7	308900	687600	18	2
1039.0	A90	5	70291.6	50	A	7.5	312600	680900	7	0
1046.0	A92	5	20871.8	50	A	5.6	342600	728000	15	0
1047.0	A921	5	16732.0	50	A	5.6	329740	694100	19	2
1048.0	A921	5	4112.3	50	A	5.6	321100	686000	14	0
1157.0	A909	5	3917.0	50	A	5.2	319500	688200	15	0
1159.0	A911	5	4615.9	50	A	6.4	322700	701460	13	0
1160.0	A912	5	2314.6	50	A	14.7	316900	710000	12	0
1161.0	A913	5	3130.5	80	A	11.0	335000	716500	12	0
1162.0	A915	5	15305.6	50	A	6.0	332000	697150	16	0
1163.0	A915	5	11683.7	50	A	3.6	350500	716800	14	0
1164.0	A917	5	2327.8	50	A	3.8	359700	706120	16	0
10707.0	M90	5	61410.8	80	A	6.5	312450	683800	22	6
10771.0	A91	5	11101.8	50	A	7.6	339300	715400	14	0
10772.0	A91	5	5589.5	50	A	9.2	327700	712900	13	0
10777.0	A92	5	20319.3	50	A	11.6	328450	701400	20	3
10801.0	A92	5	10499.5	50	A	8.8	328950	707200	15	0
10806.0	A985	5	12573.9	50	A	13.9	300000	686870	16	0
10857.0	A914	5	5571.2	50	A	9.3	342730	720600	13	0
10858.0	A921	5	10983.8	50	A	5.6	328000	690800	2	0
10928.0	A823	5	18428.0	80	A	5.1	309700	687330	19	2
10967.0	A907	5	25181.5	30	A	5.8	312900	688590	19	2
10973.0	A913	5	4827.5	30	A	6.6	324600	717900	13	0
10974.0	A915	5	12634.0	30	A	3.3	337100	701250	16	0
10975.0	A916	5	2385.8	30	A	10.0	335660	703500	12	0
10976.0	A917	5	3238.4	30	A	4.6	354600	714070	11	0
10993.0	A955	5	6918.3	30	A	5.4	336700	700000	16	0
11023.0	A92	5	34125.3	30	A	6.1	329000	699050	20	4
20777.0	A91	5	13191.5	30	A	5.8	350000	716900	4	0
20778.0	A91	5	9793.4	30	A	7.8	337000	714500	15	0
20779.0	A91	5	5843.9	30	A	9.7	323500	711500	14	0
20806.0	A985	5	11875.0	30	A	12.6	311500	683500	21	5
20858.0	A914	5	8398.6	30	A	5.6	334200	710000	14	0
20859.0	A921	5	4752.2	30	A	4.3	325000	686400	14	0
20928.0	A823	5	2788.7	30	A	11.9	308840	690000	13	0
20963.0	A907	5	3327.9	30	A	4.4	300000	690000	13	0
20965.0	A909	5	3606.7	30	A	12.8	315000	693900	14	0
20966.0	A910	5	11015.3	30	A	6.5	316450	692050	17	1
20967.0	A911	5	9818.8	30	A	9.0	329890	701050	16	0
20968.0	A912	5	4756.3	30	A	4.1	328000	705500	13	0
20970.0	A92	5	8723.1	30	A	9.1	340000	722800	15	0
20971.0	A915	5	1860.8	30	A	10.6	345000	706400	12	0
20972.0	A917	5	2448.9	30	A	6.0	348300	701500	12	0
20973.0	A917	5	5834.7	30	A	8.0	351000	716800	17	1
20991.0	A955	5	6559.1	30	A	4.2	330000	693000	16	0
21006.0	A994	5	10278.7	30	A	4.3	305000	686360	15	0
30707.0	M90	5	59012.8	80	A	8.7	313700	685700	20	3

NAEI code	Road name	Distance to receptor m	AADT in 2005	Average Speed kph	Road type	Percentage HGV	Easting	northing	Estimated Annual Mean PM10 in 2005 μgm^{-3}	24hour mean exceedence in 2005
30779.0	A91	5	7721.0	30	A	9.3	319400	709700	14	0
30810.0	A985	5	13616.8	30	A	5.1	305900	684700	16	0
30851.0	A90	5	59250.8	30	A	7.4	312340	682800	24	11
30858.0	A914	5	10104.7	30	A	6.1	343640	724800	14	0
30859.0	A921	5	10658.2	30	A	3.5	329100	692700	17	1
30929.0	A823	5	27036.2	30	A	4.7	310000	686400	21	4
30968.0	A907	5	14786.8	30	A	6.6	308980	687630	19	2
30970.0	A909	5	2283.0	30	A	5.8	320000	687500	15	0
30974.0	A913	5	2716.4	30	A	6.7	328800	718430	12	0
30975.0	A915	5	15101.1	30	A	4.2	334950	700000	17	1
30976.0	A916	5	3495.8	30	A	5.4	338500	706700	12	0
30977.0	A917	5	2519.1	30	A	3.9	360940	708000	11	0
40705.0	M90	5	26780.8	80	A	6.6	313300	694200	17	1
40778.0	A92	5	23997.2	30	A	8.2	328500	703700	18	1
40806.0	A985	5	14332.0	30	A	5.9	312000	683450	20	3
40859.0	A914	5	12067.3	30	A	4.4	337690	714100	15	0
40860.0	A921	5	9114.8	30	A	4.3	327500	688800	17	1
40929.0	A823	5	6843.0	30	A	8.5	309140	687770	17	1
40969.0	A909	5	6134.9	30	A	5.1	314000	694070	14	0
40971.0	A911	5	13123.3	30	A	4.6	332800	700700	16	0
40975.0	A915	5	11175.0	30	A	4.6	340400	702600	14	0
40976.0	A917	5	5845.9	30	A	4.9	344150	703240	12	0
40977.0	A917	5	6124.7	30	A	3.2	351650	716000	17	1
40995.0	A955	5	5608.9	30	A	5.5	333700	696700	14	0
50706.0	A823	5	18033.3	30	A	8.3	311800	684600	21	5
50768.0	A91	5	8714.0	30	A	7.0	343600	718800	14	0
50774.0	A91	5	7424.9	30	A	9.4	318150	709170	14	0
50778.0	A91	5	7772.9	30	A	9.3	333800	713400	14	0
50779.0	A92	5	21902.4	30	A	6.9	328500	700000	20	3
50801.0	A985	5	12697.0	30	A	12.0	310000	683500	21	5
50807.0	A985	5	11214.7	30	A	14.2	295400	686910	17	1
50883.0	A919	5	9194.2	30	A	6.1	345100	721700	14	0
50885.0	A915	5	2561.8	30	A	5.7	349100	713300	11	0
50886.0	A921	5	35152.9	30	A	6.4	329400	695000	22	6
50888.0	A912	5	2965.7	30	A	7.0	323440	709300	12	0
50890.0	A921	5	4113.3	30	A	4.8	323600	686300	14	0
50997.0	A92	5	6306.8	30	A	9.8	331700	715200	13	0
74281.0	A907	5	6860.3	30	A	1.8	308260	687800	15	0
74282.0	A92	5	25463.3	30	A	6.8	313600	688750	20	4
74283.0	A909	5	5295.5	30	A	7.3	318280	689480	15	0
74284.0	A921	5	13012.4	30	A	3.4	328760	692450	17	1
74410.0	M90	5	59844.0	80	A	7.4	312310	683330	22	6
78537.0	A915	5	13742.9	30	A	4.2	334690	699600	17	1
78538.0	A915	5	16284.4	30	A	4.8	336000	701060	17	1
78539.0	A915	5	12405.1	30	A	4.6	338350	701720	16	0
78540.0	A916	5	5471.5	30	A	5.7	334930	702000	14	0
78545.0	A910	5	10572.7	30	A	6.5	316820	691100	18	1
78546.0	A909	5	3820.3	30	A	12.7	316510	692750	16	0
78564.0	A907	5	6585.6	30	A	1.8	307700	688310	15	0
78565.0	A823	5	6568.3	30	A	8.5	309080	688500	16	0
78590.0	A911	5	9632.7	30	A	4.5	325000	701750	15	0
78591.0	A92	5	16554.0	30	A	7.6	328260	702500	17	1
78610.0	A910	5	12591.2	30	A	3.0	324970	694500	18	1
78611.0	A955	5	5331.1	30	A	6.9	331280	695000	14	0
78621.0	A907	5	17945.8	30	A	5.5	310720	688000	19	2
78634.0	A915	5	8864.5	30	A	3.9	350460	716000	14	0
78635.0	A917	5	8512.5	30	A	2.9	352000	715550	17	1
78679.0	A90	5	56881.3	30	A	7.4	312310	683330	24	10
80084.0	A876	5	31806.7	30	A	11.5	293200	687500	21	5
80085.0	A92	5	43956.4	30	A	8.1	316000	690100	23	7
80086.0	A92	5	43705.1	30	A	8.5	324000	694350	23	7
80087.0	A92	5	26506.1	30	A	8.8	328000	695150	23	7
80089.0	A910	5	13838.6	30	A	3.0	326000	692460	18	1
80090.0	A921	5	19094.4	30	A	3.9	315000	684100	19	2
80091.0	A977	5	21510.7	30	A	10.4	293150	690000	19	2
80092.0	A955	5	10008.1	30	A	7.7	338000	700500	16	0
80093.0	A910	5	16897.9	30	A	4.0	327340	691300	18	1
80094.0	A913	5	3599.5	30	A	15.2	326000	717075	13	0
80095.0	A911	5	18964.2	30	A	6.0	328000	701100	19	3
80096.0	A917	5	2119.2	30	A	5.6	361000	707370	11	0
80097.0	A917	5	2362.4	30	A	4.4	360660	708500	11	0
80098.0	A918	5	5820.5	30	A	8.6	351000	716600	17	1
80099.0	A907	5	22794.7	30	A	6.9	309500	687600	20	4
80100.0	A909	5	2455.0	30	A	3.9	323250	686500	14	0
80397.0	A917	5	2350.2	30	A	7.6	350000	700370	11	0
80604.0	M90	5	59915.2	80	A	9.6	313340	688180	21	5
80605	M90	5	25344.2	80	A	12.6	313740	688680	20	3
50882	A92	5	24225.1	30	A	5.6	342300	728890	20	4
74399	A876	5	26249.7	30	A	11.0	292590	687175	20	3

Maximum modelled concentrations were found at the A90 northern approach road to the Forth Road Bridge. However, these concentrations are well below the PM_{10} AQS for 2004 of 40μgm^{-3} annual mean and not more than 35 exceedences of a daily average concentration of 50μg m^{-3}. Hence, no further screening for 2005 has been undertaken.

However, for 2010, both NAEI road data (Table 10.4) and data provided by Fife Council (Table 10.5) have been used in the screening for PM_{10} concentrations against the Air Quality Objective for Scotland of 18μg m^{-3} annual average and not more than 7 exceeds of 50μg m^{-3}. This modelling work was also undertaken for the 2003 USA, but because PM_{10} values in 2010 are generally close to the PM10 Air Quality Objective for 2010, this work has been repeated for this report.

Where the initial screening of the NAEI road data with default parameters for average speed and distance to nearest receptor indicated possible exceedences of the Air Quality Objective for PM_{10}, the default speed was substituted with the average speed provided in the Fife Council data for the closest point on the same road and the default distance was substituted with the actual distance to the nearest receptor determined by Fife Council. The modelling was then repeated with these updated speeds and distances and the results are presented in Table 10.4.

Table 10.4 Estimated PM10 concentrations in 2010, using DMRB, for roads included in the NAEI database.

NAEI code	Road name	Distance to receptor m	AADT in 2010	Average Speed kph	Road Type	Percentage HGV	Easting	northing	Estimated Annual Mean PM10 in 2010 μgm^{-3}	24hour mean exceedence in 2010
707	M90	15	33973	80	A	8.4	312800	689300	15	0
771	A91	5	7350	50	A	10.3	322000	710940	12	0
1155	A907	5	16633	50	A	7.7	308900	687600	16	0
1039	A90	5	75819	50	A	7.5	312600	680900	18	2
1046	A92	5	22513	50	A	5.6	342600	728000	13	0
1047	A921	5	18048	50	A	5.6	329740	694100	16	0
1048	A921	5	4436	50	A	5.6	321100	686000	13	0
1157	A909	5	4225	50	A	5.2	319500	688200	14	0
1159	A911	5	4979	50	A	6.4	322700	701460	12	0
1160	A912	5	2497	50	A	14.7	316900	710000	11	0
1161	A913	5	3377	80	A	11.0	335000	716500	11	0
1162	A915	5	16509	50	A	6.0	332000	697150	14	0
1163	A915	5	12602	50	A	3.6	350500	716800	13	0
1164	A917	5	2511	50	A	3.8	359700	706120	14	0
10707	M90	15	66240	80	A	6.5	312450	683800	18	1
10771	A91	5	11975	50	A	7.6	339300	715400	12	0
10772	A91	5	6029	50	A	9.2	327700	712900	11	0
10777	A92	5	21917	50	A	11.6	328450	701400	17	1
10801	A92	5	11325	50	A	8.8	328950	707200	13	0
10806	A985	5	13563	50	A	13.9	300000	686870	14	0
10857	A914	5	6009	50	A	9.3	342730	720600	12	0
10858	A921	5	11847	50	A	5.6	328000	690800	16	0
10928	A823	5	19877	80	A	5.1	309700	687330	16	0
10967	A907	5	27162	30	A	5.8	312900	688590	16	0
10973	A913	5	5207	30	A	6.6	324600	717900	12	0
10974	A915	5	13627	30	A	3.3	337100	701250	14	0
10975	A916	5	2573	30	A	10.0	335660	703500	11	0
10976	A917	5	3493	30	A	4.6	354600	714070	11	0
10993	A955	5	7462	30	A	5.4	336700	700000	14	0
11023	A92	5	36809	30	A	6.1	329000	699050	17	1
20777	A91	5	14229	30	A	5.8	350000	716900	17	1
20778	A91	5	10563	30	A	7.8	337000	714500	13	0
20779	A91	5	6303	30	A	9.7	323500	711500	12	0
20806	A985	5	12809	45	A	12.6	311500	683500	17	1
20858	A914	5	9059	30	A	5.6	334200	710000	13	0
20859	A921	5	5126	30	A	4.3	325000	686400	12	0
20928	A823	5	3008	30	A	11.9	308840	690000	12	0
20963	A907	5	3590	30	A	4.4	300000	690000	12	0
20965	A909	5	3890	30	A	12.8	315000	693900	12	0
20966	A910	5	11881	30	A	6.5	316450	692050	15	0
20967	A911	5	10591	30	A	9.0	329890	701050	14	0
20968	A912	5	5130	30	A	4.1	328000	705500	12	0
20970	A92	5	9409	30	A	9.1	340000	722800	13	0
20971	A915	5	2007	30	A	10.6	345000	706400	11	0
20972	A917	5	2641	30	A	6.0	348300	701500	11	0
20973	A917	5	6294	30	A	8.0	351000	716800	15	0
20991	A955	5	7075	30	A	4.2	330000	693000	14	0
21006	A994	5	11087	30	A	4.3	305000	686360	13	0
30707	M90	15	63653	80	A	8.7	313700	685700	16	0
30779	A91	5	8328	30	A	9.3	319400	709700	12	0
30810	A985	5	14687	30	A	5.1	305900	684700	14	0

NAEI code	Road name	Distance to receptor m	AADT in 2010	Average Speed kph	Road Type	Percentage HGV	Easting	northing	Estimated Annual Mean PM10 in 2010 μgm^{-3}	24hour mean exceedence in 2010
30851	A90	52	63910	95	A	7.4	312340	682800	16	0
30858	A914	5	10899	30	A	6.1	343640	724800	12	0
30859	A921	5	11496	30	A	3.5	329100	692700	16	0
30929	A823	5	29162	30	A	4.7	310000	686400	18	1
30968	A907	5	15949	30	A	6.6	308980	687630	16	0
30970	A909	5	2463	30	A	5.8	320000	687500	14	0
30974	A913	5	2930	30	A	6.7	328800	718430	11	0
30975	A915	5	16289	30	A	4.2	334950	700000	15	0
30976	A916	5	3771	30	A	5.4	338500	706700	11	0
30977	A917	5	2717	30	A	3.9	360940	708000	10	0
40705	M90	15	28887	80	A	6.6	313300	694200	14	0
40778	A92	5	25884	30	A	8.2	328500	703700	15	0
40806	A985	5	15459	30	A	5.9	312000	683450	17	1
40859	A914	5	13016	30	A	4.4	337690	714100	13	0
40860	A921	5	9832	30	A	4.3	327500	688800	16	0
40929	A823	5	7381	30	A	8.5	309140	687770	15	0
40969	A909	5	6617	30	A	5.1	314000	694070	13	0
40971	A911	5	14155	30	A	4.6	332800	700700	14	0
40975	A915	5	12054	30	A	4.6	340400	702600	13	0
40976	A917	5	6306	30	A	4.9	344150	703240	11	0
40977	A917	5	6606	30	A	3.2	351650	716000	15	0
40995	A955	5	6050	30	A	5.5	333700	696700	13	0
50706	A823	5	19451	30	A	8.3	311800	684600	18	1
50768	A91	5	9399	30	A	7.0	343600	718800	12	0
50774	A91	5	8009	30	A	9.4	318150	709170	12	0
50778	A91	5	8384	30	A	9.3	333800	713400	12	0
50779	A92	5	23625	30	A	6.9	328500	700000	17	1
50801	A985	5	13695	45	A	12.0	310000	683500	17	1
50807	A985	5	12097	30	A	14.2	295400	686910	14	0
50883	A919	5	9917	30	A	6.1	345100	721700	12	0
50885	A915	5	2763	30	A	5.7	349100	713300	11	0
50886	A921	10	37917	50	A	6.4	329400	695000	17	1
50888	A912	5	3199	30	A	7.0	323440	709300	11	0
50890	A921	5	4437	30	A	4.8	323600	686300	12	0
50997	A92	5	6803	30	A	9.8	331700	715200	12	0
74281	A907	5	7400	30	A	1.8	308260	687800	14	0
74282	A92	5	27466	30	A	6.8	313600	688750	17	1
74283	A909	5	5712	30	A	7.3	318280	689480	13	0
74284	A921	5	14036	30	A	3.4	328760	692450	15	0
74410	M90	15	64550	80	A	7.4	312310	683330	17	1
78537	A915	5	14824	30	A	4.2	334690	699600	15	0
78538	A915	5	17565	30	A	4.8	336000	701060	15	0
78539	A915	5	13380	30	A	4.6	338350	701720	14	0
78540	A916	5	5902	30	A	5.7	334930	702000	12	0
78545	A910	5	11404	30	A	6.5	316820	691100	15	0
78546	A909	5	4121	30	A	12.7	316510	692750	14	0
78564	A907	5	7103	30	A	1.8	307700	688310	14	0
78565	A823	5	7085	30	A	8.5	309080	688500	14	0
78590	A911	5	10390	30	A	4.5	325000	701750	14	0
78591	A92	5	17856	30	A	7.6	328260	702500	15	0
78610	A910	5	13581	30	A	3.0	324970	694500	16	0
78611	A955	5	5750	30	A	6.9	331280	695000	13	0
78621	A907	5	19357	30	A	5.5	310720	688000	16	0
78634	A915	5	9562	30	A	3.9	350460	716000	13	0
78635	A917	5	9182	30	A	2.9	352000	715550	15	0
78679	A90	52	61354	95	A	7.4	312310	683330	16	0
80084	A876	5	34308	30	A	11.5	293200	687500	16	0
80085	A92	28.5	47413	106	A	8.1	316000	690100	16	0
80086	A92	10	47142	103	A	8.5	324000	694350	18	1
80087	A92	24.1	28590	103	A	8.8	328000	695150	17	1
80089	A910	5	14927	30	A	3.0	326000	692460	16	0
80090	A921	5	20596	30	A	3.9	315000	684100	16	0
80091	A977	5	23202	30	A	10.4	293150	690000	15	0
80092	A955	5	10795	30	A	7.7	338000	700500	14	0
80093	A910	5	18227	30	A	4.0	327340	691300	16	0
80094	A913	5	3883	30	A	15.2	326000	717075	12	0
80095	A911	5	20455	30	A	6.0	328000	701100	16	0
80096	A917	5	2286	30	A	5.6	361000	707370	10	0
80097	A917	5	2548	30	A	4.4	360660	708500	10	0
80098	A918	5	6278	30	A	8.6	351000	716600	15	0
80099	A907	5	24587	30	A	6.9	309500	687600	17	1
80100	A909	5	2648	30	A	3.9	323250	686500	12	0
80397	A917	5	2535	30	A	7.6	350000	700370	11	0
80604	M90	15	64626	80	A	9.6	313340	688180	16	0
80605	M90	15	27337	80	A	12.6	313740	688680	16	0
50882	A92	5	26130	30	A	5.6	342300	728890	17	1
74399	A876	5	28314	30	A	11.0	292590	687175	16	0

Table 10.4 indicates that there are no anticipated exceedences of the 18μg m^{-3} air quality objective for PM_{10}, based on the NAEI dataset.

For modelling for 2010 with Fife Council data, the distance to the nearest receptor was initially estimated as half the road width plus 2m. As noted in Section 10.4.2, a background concentration for PM_{10} in 2010 was taken to be 14.2μgm^{-3}. Where this initial screening indicated possible exceedences of the Air Quality Objective for PM_{10}, the calculated distance to the nearest receptor was substituted with the actual distance determined by Fife Council. The modelling was then repeated with these updated distances and the results are presented in Table 10.5.

Table 10.5 Estimated PM10 concentrations in 2010, using DMRB, for road data provide by Fife Council.

Code	Grid Reference	Road name	Description	Distance. to Receptor m	AADF in 2010	Average Speed kph	Percentage HGV	Estimated Annual Mean PM10 in 2010 μgm^{-3}	24hour mean exceedence in 2010
1	NT091877	A907	Dunfermline, Carnegie Drive - Between A823 (Pilmuir Street) and Chalmers St.	5.6	13448.3	35	9.75	17	1
2	NT095876	A907	Dunfermline, Carnegie Drive - Bet. A823 (Pilmuir St) & A823 (St.Margarets Drive)	9.7	24398.9	40	18.9	17	1
3	NT078883	A907	Dunfermline, Rumblingwell - Between William Street & Boundary North-West	5.3	11609.0	45	6.6	16	0
4	NT100876	A907	Dunfermline, Halbeath Rd - Between B912 & A823 (Sinclair Gdns)	5.9	22116.1	48	6.16	16	0
5	NT166915	A909	Cowdenbeath, High Street - Between Broad Street and B981 (Lumphinnans Rd)	4.8	15713.1	35	9.68	17	1
6	NO376146	A91	Cupar, St.Catherine Street - Between A914 (Crossgate) and B940 (Pitscottie Rd)	7.0	14337.3	38	8.94	16	0
7	NO370145	A91	Cupar, Bonnygate - Between A914 (Crossgate) and A913 (Balgarvie Road)	6.5	11743.0	43	16.09	16	0
8	NT273915	A910	Kirkcaldy, Forth Avenue - Between Oriel Road and Abbotshall Road	5.5	13617.5	45	4.4	16	0
9	NT272912	A910	Kirkcaldy, Abbotshall Road - Between B925 (Boglily Road) and Forth Avenue	6.1	18784.1	42	10.75	17	1
10	NO248017	A911	Leslie,High Street-Between Cabbagehall Rd & Western Ave (Leslie Rdt)	5.7	12553.1	48	8.3	16	0
11	NO505168	A915	St.Andrews, City Road - Between A91 (Pilmour Links) and A918 (West Port)	4.6	11552.1	45	5.52	15	0
12	NO505163	A915	St.Andrews, Bridge Street - Between A918 (South Street) and Lamond Drive	5.9	11023.0	45	4.69	15	0
13	NO410028	A915	Lundin Links Village	5.0	9925.5	50	6.13	15	0
14	NO450192	A919	Guardbridge, Main Street - Between A91 and Boundary North	5.6	12294.4	50	14.01	16	0
15	NT294934	A921	Kirkcaldy, St.Clair Street - Between Windmill Road and Millie Street	6.7	16907.9	50	13.39	16	0
16	NO383012	A955	Leven, Scoonie Rd./Durie St. - Between Shorehead & A915 (Scoonie Rdbt)	5.1	11403.6	45	8.34	16	0
17	NT364998	A955	Methil, Methilhaven Road - Between Sea Road and B932 (Methil Brae)	5.3	11035.7	50	12.62	16	0
	NT050864	A994	Cairneyhill Village	5.3	11182.0	52	14.5	16	0
19	NT068867	A994	Crossford Village	5.8	13442.8	50	10.33	16	0
20	NT085875	A994	Dunfermline, Pittencrieff Street - Between William Street and Bruce Street	5.6	10996.4	45	11.03	16	0
22	NT185940	B920	Between B981 (Lochgelly, Auchterderran Road) and Lochgelly Boundary North	5.2	13046.2	52	10.23	16	0
23	NT278921	B925	Kirkcaldy, Victoria Road - Between Bennochy Road and Factory Road	5.5	15254.6	48	10.6	16	0
24	NT167924	B981	Between A909 (Kelty Junction Rdbt) and B920 (Lochgelly, Lumphinnans Road)	5.4	10814.1	52	9.84	16	0
25	NT131833	B981	Inverkeithing, Chapel Place - Between Boreland Road and A921	5.7	11131.6	45	8.8	16	0
26	NO459173	A91	St.Andrews, Guardbridge Road	5.5	13702.6	75	8.4	16	0
27	NO378004	A955	Leven, Bawbee Bridge	7.2	19232.3	45	9.3	16	0
28	NO344004	A911	Between A915 (Durie Vale Roundabout) and Windygates West Access	6.5	12060.8	80	8.01	16	0
29	NO383008	A955	Leven, Promenade / School Lane	6.3	9508.2	48	7.5	15	0
30	NO437245	A914	Between A919 (St.Michaels) and A914 (Forgan Roundabout)	6.4	12293.1	80	5.5	15	0
31	NT318971	A915	Between Coaltown of Wemyss access and B930	5.7	16861.0	80	10.17	16	0
32	NO266015	A911	Glenrothes - Between Rothes Road and Western Avenue (Leslie Roundabout)	5.6	18783.0	64	8	16	0
33	NT123826	A921	Between M90 Jct.1 (Admiralty) and B981 (Inverkeithing)	6.0	22532.6	55	9.22	16	0
34	NT125884	A907	Dunfermline – Halbeath Road, Between M90 Jct.3 and Whitefield Road	9.7	28631.9	40	8.55	17	1

Code	Grid Reference	Road name	Description	Distance. to Receptor m	AADF in 2010	Average Speed kph	Percentage HGV	Estimated Annual Mean PM10 in 2010 μgm^{-3}	24hour mean exceedence in 2010
35	NO308011	A911	Between Milton of Balgonie and B9130	5.9	12207.1	80	9.05	16	0
36	NO350003	A915	Windygates By-Pass - Bet. A911 (Durie Vale Rdbt) & B932 (Cameron Rdbt)	6.7	21137.6	80	9.6	16	0
37	NO327007	A911	Between Windygates Access West and Milton of Balgonie	5.7	14489.8	80	7.63	16	0
38	NO398159	A91	Between Cupar and Dairsie	5.9	11630.5	65	18.6	16	0
39	NT279905	A921	Kirkcaldy, Esplanade - Between Bridge Street and Nicol Street	8.2	10683.6	55	12.88	16	0
40	NT161845	A921	Between B916 (Hillend) and Dalgety Bay East Access	7.9	21243.9	55	8	16	0
41	NO395024	A915	Between Leven and Lundin Links	5.9	12466.2	70	11.77	16	0
42	NT250943	A910	Between A92(T) (Chapel Interchange) and Chapel Roundabout	6.8	25399.2	64	6.86	16	0
43	NT041863	A994	Between Cairneyhill and A985(T) (Torryburn Roundabout)	5.5	10263.6	70	11.92	15	0
44	NT276888	A921	Between Kirkcaldy Boundary South-West and B923 (Kinghorn)	5.1	12165.0	68	5.21	15	0
45	NT278913	A921	Kirkcaldy, Esplanade - Between Nicol Street and High Street	7.4	14873.9	50	7.56	16	0
46	NT174848	A921	Between B9157 (Sherrif Roundabout) and Dalgety Bay East Access	6.3	10189.5	70	7.53	15	0
47	NT079898	A994	Between Crossford and Dunfermline Boundary South-West	5.3	13792.4	70	9.72	16	0
48	NT097865	A823	Dunfermline – Between B916 (Aberdour Rd) & B9156 (Bothwell Gdns)	7.0	30388.7	48	15.17	17	1
49	NT135836	A921	Between Inverkeithing and Spencerfield Junction	7.4	18109.7	70	7.06	16	0
50	NO364012	A915	Between A911 (Durie Vale Roundabout) and B933 (Leven, Glenlyon Road)	5.7	14847.8	72	8.73	16	0
51	NT304958	A915	Between Kirkcaldy (Boreland Roundabout) and Coaltown of Wemyss Access	5.9	15850.6	80	8.52	16	0
52	NT354984	A955	Leven, Methilhaven Road - Between B930 (Percival Road) & B931 (Toll Park)	5.9	9769.5	48	8.89	15	0
53	NT268918	A910	Kirkcaldy, Oriel Road - Between Strathallan Drive and Forth Avenue	5.6	15399.3	60	4.46	16	0
54	NO379147	A91	Cupar, East Road - Between B940 (Pitscottie Road) and Boundary East	6.0	14143.7	50	16.8	16	0
55	NO418177	A91	Between Dairsie Boundary West and A91 (Dairsie Roundabout)	5.2	11154.4	50	19.3	16	0
56	NO322008	A911	Between Milton of Balgonie East access and West access	5.5	13846.1	80	8.36	16	0
57	NO555188	A91	Guardbridge, St.Andrews Road - Between A919 (Main St.) & Strathkinness Rd	6.0	19070.4	60	5.5	16	0
58	NO378015	A915	Leven – Between A955 (Scoonie Roundabout) and B933 (Glenlyon Road)	5.7	11891.5	45	12.94	16	0
59	NO383017	A915	Leven – Between A955 (Scoonie Roundabout) and B927 (Cupar Road)	6.5	15022.8	48	11.64	16	0
60	NT299945	A915	Kirkcaldy, Randolph Road - Between Gallatown (A921) and Boreland Rdbt	6.1	19857.6	50	15.73	17	1
61	NT291927	A921	Kirkcaldy, St.Clair Street - Between Millie Street and A955 (Dysart Road)	9.8	15513.1	50	6.8	16	0
62	NT297942	A921	Kirkcaldy, Rosslyn Street - Bet. A915 (Gallatown Rdbt) & (B928) Windmill Rd	8.9	18552.6	50	6.82	16	0
63	NT347997	A915	Between B930 and B932 (Cameron Roundabout)	6.7	17075.1	70	8.1	16	0
64	NO294011	A911	Markinch By-pass - Between A92(T) (Preston Rdbt) and Markinch Access Road	5.6	11849.3	70	8	15	0
65	NO278012	A911	Glenrothes, Queensway - Between A92(T) (Preston Rdbt) and Rothes Road	9.3	23949.3	70	8.3	16	0
66	NT295947	A921	Between A92(T) (Redhouse Roundabout) and A915 (Gallatown Roundabout)	9.8	33714.9	80	9.28	16	0
67	NT106855	A823	Dunfermline, Queensferry Road - Between B916 and A823(M)(Pitreavie Rdbt)	9.3	23587.6	75	7.71	16	0
68	NT097874	A823	Dunfermline, St.Margarets Drive - Between Bothwell Gdns and Sinclair Gdns	9.1	23772.8	60	9	16	0
69	NT125808	A90	Welldean Lay-by (Forth Road Bridge North Approach)	52	74615.9	95	12.94	16	0
70	NT247951	B981	Between B922 (Cluny) and A92(T) (Chapel Interchange)	5.8	11544.7	64	6.63	15	0
71	NT263941	B981	Kirkcaldy, Chapel Level - Between A910 and Hendry Road	5.3	16170.2	55	9.03	16	0
72	NT276937	B981	Kirkcaldy, Dunnikier Way - Between Hendry Road and Whytemans Brae	7.1	20092.6	64	7	16	0
73	NT284994	B921	Between A92(T) (Bankhead Interchange) and Stenton Roundabout	9.2	11526.6	80	9.95	15	0
74	NT248994	B921	Between C33 (To Auchmuirbridge) & Glenrothes, Golf Course Road Fly-Over	5.4	11840.5	85	15.43	16	0

Code	Grid Reference	Road name	Description	Distance. to Receptor m	AADF in 2010	Average Speed kph	Percentage HGV	Estimated Annual Mean PM10 in 2010 μgm^{-3}	24hour mean exceedence in 2010
75	NT092869	B9156	Dunfermline, Nethertown Broad Street - Between A823 and Coal Road	7.9	16230.5	40	6.6	16	0
76	NO270013		Rothes Road Glenrothes - was B969 - unclassified from Oct 1996		10643.4	40	4.5	15	
77	NT083882	B9155	Dunfermline, Baldridgeburn - Between A907 (William St) & A823 (Arthur St)	6.2	10336.9	48	9.96	16	0
	NO273003	B969	Glenrothes, Rothes Road - Bet. South Parks Road and B921 (Stenton)	7.2	12282.3	60	5.25	15	0
78	NT115885	B912	Dunfermline, Whitefield Road - South of Hospital Access	5.7	14308.4	45	5.11	16	0
79	NO375011	B933	Leven, Glenlyon Road - Between A915 and Riverside Road	5.8	12094.5	45	9.23	16	0
	NT242989	B921	Between C33 (To Auchmuirbridge) and B922 (To Cluny)	5.6	12080.7	75	8.25	16	0
80	NO262018	B969	Glenrothes, Leven Bridge (Leslie Roundabput to South Parks)	6.0	11934.9	70	8	15	0
81	NO259011	B969	Glenrothes, Tanshall Link (South Parks to Tanshall Roundabout)	5.7	12463.0	50	8.85	16	0
	NT277010	C129	Glenrothes, Church Street	5.8	12458.0	40	11.8	16	0
89	NS931874	A876(T)	Kincardine – Between A977(T) (Toll R/A) and Kincardine Bridge	6.4	19978.9	40	12.88	17	1
90	NS930880	A977(T)	Kincardine, Feregait - Between A977(T) (Toll R/A) and Boundary North	5.7	16959.1	50	11.17	16	0
91	NS933875	A977(T)	Between A876(T) / A977(T) and Longannet Access Road	5.7	9950.9	62	15.81	16	0
92	NT121834	A985(T)	Between M90 Jct.1 (Admiralty) and A823 Rosyth, Queensferry Road	5.7	16234.4	45	11.75	16	0
93	NT370864	A985(T)	Torryburn By-Pass	6.7	12830.9	80	18.16	16	0
94	NT150895	A92(T)	E.F.R.R. Phase 1 - Between B925 (Crossgates) and A909 (Cowdenbeath)	28.5	48877.6	106	12.11	17	1
95	NT278952	A92(T)	E.F.R.R. Phase 4 - Between B981 (Chapel) & A921 (Redhouse Rdbt)	11.3	29484.7	103	13.07	17	1
96	NT294967	A92(T)	Between B921 (Bankhead Roundabout) and A921 (Redhouse Roundabout)	11.3	34552.4	110	9.29	18	1
97	NO284000	A92(T)	Between A911 (Preston Roundabout) and B921 (Bankhead Roundabout)	11.3	26515.2	100	7.4	18	1
98	NO284032	A92(T)	Between A911 (Preston Roundabout) and B969 (Balfarg Junction)	5.7	17900.9	78	12.22	17	0
99	NO298098	A92(T)	Between B938 (Ladybank South Access) and A91(T) (Melville Lodges Rdbt)	5.7	8550.6	87	9.39	15	0
100	NO333182	A92(T)	Between A913 (Parbroath Crossroads) and Rathillet	5.7	7340.4	90	9.06	15	0
101	NO426279	A92(T)	Between A914 (Forgan Roundabout) and Tay Road Bridge Roundabout	9.3	19800.0	100	8.3	17	1
102	NT124836	M90	Admiralty interchange	22.5	54983.2	110	11.96	18	1
103	NT136906	M90	Between Junction 3 (Halbeath) and 4 (Kelty)	11.3	30294.4	110	9.28	18	1
104	NS933870	A985(T)	Kincardine Eastern Link Road	7.5	11510.0	75	16.69	16	0

Data for roads in Table 10.5 also show no predicted exceedence of the 18μgm^{-3} PM_{10} Air Quality Objective for 2010.

D. Junctions

Detailed information on intersecting roads in Fife has been supplied by the Council for this report. All junctions were initially screened using DMRB with the receptor distance and background concentrations as defined earlier. Where this initial screening indicated possible exceedences of the Air Quality Objective for PM_{10}, the calculated distance to the nearest receptor was substituted with the actual distance determined by Fife Council. The modelling was then repeated with these updated distances and the updated results are presented in Table 10.6.

Table 10.6 Estimated PM10 concentrations in 2010, using DMRB, for busy road junctions in Fife

Code	Name	Description	Dist to receptor m	AADT 2010	Avg Speed kph	Road Type	% HDV	Estimated PM10 conc 2010 μgm^{-3}	Estimated days of exceedece
A	A907	Dunfermline, Carnegie Drive - Bet. A823 (Pilmuir St) & A823 (St.Margarets Drive)	30	24399	30	A	18.9	18	1
	A823	Dunfermline, St.Margarets Drive - Between Bothwell Gdns and Sinclair Gdns	74	23773	30	A	9		
B	A907	Dunfermline, Rumblingwell - Between William Street & Boundary North-West	5.3	11609	30	A	6.6	18	1
	B9155	Dunfermline, Baldridgeburn - Between A907	6.235	10337	30	B	9.96		

Code	Name	Description	Dist to receptor m	AADT 2010	Avg Speed kph	Road Type	% HDV	Estimated PM10 conc 2010 μgm^{-3}	Estimated days of exceedece
		(William St) & A823 (Arthur St)							
C	A909	Cowdenbeath, High Street - Between Broad Street and B981 (Lumphinnans Rd)	15.1	15713	30	A	9.68	18	2
	B981	Between A909 (Kelty Junction Rdbt) and B920 (Lochgelly, Lumphinnans Road)	15.1	10814	30	B	9.84		
D	A910	Kirkcaldy, Forth Avenue - Between Oriel Road and Abbotshall Road	210	13618	30	A	4.4	14	0
	A910	Kirkcaldy, Oriel Road - Between Strathallan Drive and Forth Avenue	210	15399	30	A	4.46		
E	A910	Kirkcaldy, Forth Avenue - Between Oriel Road and Abbotshall Road	17.3	13618	30	A	4.4	18	2
	A910	Kirkcaldy, Abbotshall Road - Between B925 (Boglily Road) and Forth Avenue	17.3	18784	30	A	10.75		
F	A919	Guardbridge, Main Street - Between A91 and Boundary North	21	12294	30	A	14.01	18	2
	A91	Guardbridge, St.Andrews Road - Between A919 (Main St.) & Strathkinness Rd	21	19070	30	A	5.5		
G	A955	Leven, Scoonie Rd./Durie St. - Between Shorehead & A915 (Scoonie Rdbt)	10.0	11404	30	A	8.34	18	1
	A915	Leven – Between A955 (Scoonie Roundabout) and B927 (Cupar Road)	37	15023	30	A	11.64		
H	A911	Between A915 (Durie Vale Roundabout) and Windygates West Access	49.6	12061	30	A	8.01	16	0
	A915	Windygates By-Pass - Bet. A911 (Durie Vale Rdbt) & B932 (Cameron Rdbt)	49.6	21138	30	A	9.6		
I	A914	Between A919 (St.Michaels) and A914 (Forgan Roundabout)	135.2	12293	30	A	5.5	15	0
	A92(T)	Between A914 (Forgan Roundabout) and Tay Road Bridge Roundabout	135.2	19800	30	A	8.3		
J	A911	Glenrothes - Between Rothes Road and Western Avenue (Leslie Roundabout)	53	18783	30	A	8	16	0
	B969	Glenrothes, Leven Bridge (Leslie Roundabput to South Parks)	53	11935	30	B	8		
K	A921	Between M90 Jct.1 (Admiralty) and B981 (Inverkeithing)	165	22533	30	A	9.22	16	1
	A985(T)	Between M90 Jct.1 (Admiralty) and A823 Rosyth, Queensferry Road	30.2	16234	30	A	11.75		
	M90	Admiralty interchange	100	54983	110	A	11.96		
L	A907	Dunfermline - Halbeath Road, Between M90 Jct.3 and Whitefield Road	33	28632	30	A	8.55	16	0
	A92(T)	E.F.R.R. Phase 1 - Between B925 (Crossgates) and A909 (Cowdenbeath)	230	48878	30	A	12.11		
	M90	Between Junction 3 (Halbeath) and 4 (Kelty)	130	30294	110	A	9.28		
M	A910	Between A92(T) (Chapel Interchange) and Chapel Roundabout	46.5	25399	30	A	6.86	17	1
	A92(T)	E.F.R.R. Phase 4 - Between B981 (Chapel) & A921 (Redhouse Rdbt)	46.5	29485	30	A	13.07		
N	A994	Between Cairneyhill and A985(T) (Torryburn Roundabout)	232	10264	30	A	11.92	14	0
	A985(T)	Torryburn By-Pass	232	12831	30	A	18.16		
O	A823	Dunfermline - Between B916 (Aberdour Rd) & B9156 (Bothwell Gdns)	25.5	30389	30	A	15.17	18	1
	B9156	Dunfermline, Nethertown Broad Street - Between A823 and Coal Road	80	16231	30	B	6.6		
P	A915	Between A911 (Durie Vale Roundabout) and B933 (Leven, Glenlyon Road)	23	14848	30	A	8.73	17	1
	B933	Leven, Glenlyon Road - Between A915 and Riverside Road	23	12094	30	B	9.23		
Q	A911	Glenrothes, Queensway - Between A92(T) (Preston Rdbt) and Rothes Road	39.8	23949	30	A	8.3	17	1
	A92(T)	Between A911 (Preston Roundabout) and B921 (Bankhead Roundabout)	39.8	26515	30	A	7.4		
R	A911	Glenrothes, Queensway - Between A92(T) (Preston Rdbt) and Rothes Road	39.8	23949	30	A	8.3	17	1
	C129	Glenrothes, Church Street	39.8	12458	30	B	11.8		
S	A921	Between A92(T) (Redhouse Roundabout) and A915 (Gallatown Roundabout)	83.3	33715	30	A	9.28	15	0
	B981	Kirkcaldy, Dunnikier Way - Between Hendry Road and Whytemans Brae	83.3	20093	30	B	7		
T	A921	Between A92(T) (Redhouse Roundabout) and A915 (Gallatown Roundabout)	60	33715	30	A	9.28	16	0
	A92(T)	Between B921 (Bankhead Roundabout) and A921 (Redhouse Roundabout)	60	34552	30	A	9.29		
U	A907	Dunfermline, Halbeath Rd - Between B912 & A823 (Sinclair Gdns)	32	22116	30	A	6.16	17	1
	B912	Dunfermline, Whitefield Road - South of Hospital Access	32	14308	30	B	5.11		
V	B921	Between A92(T) (Bankhead Interchange) and Stenton Roundabout	89.6	11527	30	B	9.95	15	0
	A92(T)	Between B921 (Bankhead Roundabout) and A921 (Redhouse Roundabout)	89.6	34552	30	A	9.29		
W	B921	Between A92(T) (Bankhead Interchange) and Stenton Roundabout	9.16	11527	30	B	9.95	18	1

Code	Name	Description	Dist to receptor m	AADT 2010	Avg Speed kph	Road Type	% HDV	Estimated PM10 conc 2010 μgm^{-3}	Estimated days of exceedece
	B969	Glenrothes, Rothes Road - Bet. South Parks Road and B921 (Stenton)	7.19	12282	30	B	5.25		

X	A876(T)	Kincardine - Between A977(T) (Toll R/A) and Kincardine Bridge	31.3	19979	30	A	12.88	18	1
	A985(T)	Kincardine Eastern Link Road	31.3	11510	30	A	16.69		

Table 10.6 shows that estimated PM_{10} concentrations do not exceed the 18μgm^{-3} PM_{10} annual average for 2010 at any of the road junctions identified in Fife.

E. Roads with high flows of buses and/or HGV's

In the previous USA report, Market Street Dunfermline was identified as a road with an unusually high proportion of HGV vehicles (67%). However, the total traffic flow was low at about 2500 vehicles per day and hence, DMRB modelling indicated no exceedence of the PM_{10} objective. The same road is identified this time, but it is noted that there is a junction between this road and the busy (22249 veh/day) Carnegie Drive. Hence, DMRB modelling has been repeated to check the combined effect of both roads. Initial screening with the same parameters as in previous DMRB modelling in this report indicated a possible exceedence of the 2010 objective and hence, this junction was remodelled using actual distances to the nearest receptor (provided by Fife Council). Modelling with these actual distances indicates that the objective will not be exceeded. (See Table 10.7)

One additional road with a high HGV component was identified – Rosyth Port Access. However, this had a very low total flow of 1647 veh/day and DMRB modelling indicated an annual average PM_{10} concentration of only 15μgm^{-3} in 2010 (See Table 10.7)

Table 10.7 Estimated PM10 concentrations in 2010, using DMRB, for Roads with high HGV flows.

Name	Description	Dist to receptor m	AADT 2010	Avg Speed kph	Road Type	% HDV	Estimated PM10 conc 2010 μgm^{-3}	Estimated days of exceedece
A907	Dunfermline, Carnegie Drive	22.7	24399	40	A	18.9	18	1
N/A	Dunfermline, Market Street	22.7	2683	40	B	66.8		
N/A	Rosyth Port Access	5.8	1746	40	A	64.78	15	0

F. New roads constructed or proposed since the previous round of Review and Assessment

During 2004, the Kincardine Eastern Link road was opened. This road has been included in the assessment of general roads in Table 10.6 above. Modelled PM_{10} concentrations from this road are below the PM10 AQS Objective for 2010.

G. Roads with significantly changed traffic flows, or new relevant exposure

Modelling of roads with increased traffic flow has been included in the appropriate sections above.

H Roads close to the objectives during the second round of review and assessment

All roads have been remodelled for 2010.

I. New industrial sources

SEPA have provided updating information on industrial installations in Fife (covered by the Stirling and Glenrothes teams) relating to changes that have been introduced since May 2005. Changes between the date of issue of the previous USA in 2003 and May 2005 have been covered in the 2 intervening progress reports.

SEPA have identified the following changes to Part A or B processes that will result in a positive or negative effect on the local air quality:

- Negative changes: Tullis Russell will be changing from burning gas to using another coal fired boiler
- Positive Changes: Silberline PPC\E\20036, instalment and operation of Abatement system for VOCs

At Tullis Russell, SEPA confirm that the operator has already carried out a detailed modelling assessment of the Tullis Russell site that has considered the emissions of particulate material, SO_2, NOx and CO. SEPA is currently discussing the results of this modelling assessment with the operator and will provide Fife Council with details of this assessment once it has been agreed with the operator.

In addition, United Glass in Alloa are now permitted to use heavy fuel oil as well as natural gas.

Two new PPC permits have been issued for Fife, a Part B for the coating process at FMC, Pitreavie Business Park, Dunfermline (solvent consumption exceeded threshold) and a Part A Inorganic Chemical process at Lexmark, Rosyth. Both these installations were existing but are new to regulation under PPC. SEPA have confirmed that there will be no major change to emissions from these processes, although the VOC emissions from FMC are likely to have increased proportionately with increased production.

Scottish Power Generation Ltd have recently applied for a permit under the Pollution Prevention and Control Regulations which includes the application of flue gas desulphurisation to three of the 4 main vent stacks from Longannet Power Station. The fourth vent will continue to operate using low sulphur fuel as SO_2 abatement method. The Permit Application states that " the measured and modelled releases of SO_2, NOx and particulates from Longannet Power Station at the point of maximum impact are below Air Quality Strategy targets for 2004/5 and the particulate matter targets up to 2010."

The following Part A or B processes in Fife have ceased to operate:
Lynebank Service Station PVR, Halbeath Road Dunfermline
Halbeath Petrol Station PVR, Halbeath Road, Dunfermline
Kingdom Services PVR
Fentons Meadowhill Open Cast Coal Site - actually in Clackmannanshire, but may impact on air quality in Fife
Buko, Glenrothes, PPC\E\20074
Forbo Nairns, Kirkcaldy, PPC\E\20037
Part B: Nationwide, Kirkcaldy, APC\E\464
Randolf Paintshop, Kirkcaldy, APC\E\20069
Forth Ports Coal Handling, Methil, APC\E\431

There are no new petrol stations with an annual throughput of over 2000 cubic metres of petrol.

There are no new mineral extraction processes that are likely to have a significant impact on the local air quality.

SEPA have confirmed that there are no other sources they would like to see included in the Council's assessment.

J. Industrial sources with substantially increased emissions or new relevant exposure
The only SEPA regulated process that has increased its emissions to air by more than 30% will be Tullis Russell when the coal fired boiler commences operation – this is discussed in the section J above.

K. Areas of domestic solid fuel burning
The 2003 Updating and Screening assessment thoroughly screened settlements in Fife likely to have significant solid fuel use. Only Crossgates was identified for possible further evaluation. This work was reported in 2004 Progress report which confirmed that the actual number of properties burning coal was much less that estimated and hence no further assessment was required for either SO_2 or PM_{10}.

l. Quarries/landfill/opencast coal/handling of dusty cargoes at ports etc.
There are no new mineral extraction process that are likely to have a significant impact on local air quality

M Aircraft

There are no major airports in Fife and Edinburgh Airport in a neighbouring authority is 7km from the nearest boundary with Fife and hence its contribution to PM_{10} concentrations within Fife is considered to be negligible.

10.5 CONCLUSION FOR PM10

Monitoring of PM_{10} at Admiralty Road, Rosyth indicates that the 2004 Air Quality Objectives for PM_{10} are unlikely to be exceeded but that the 2010 Objectives may be closely approached. Hence, Fife Council will further investigate PM_{10} concentrations at this location by redeploying the Groundhog monitoring facility to this site when it is available for use again by Fife Council at the end of 2006.

Similarly, the short period of PM_{10} monitoring at Bonnygate, Cupar indicates that the PM_{10} objectives for 2004 are unlikely to be exceeded, but that there is more likelihood of exceeding the 2010 objectives. However, at present, the duration of the monitoring is too short to make any firm conclusions. It is recommended that monitoring continues at this site for at least a full year.

Screening modelling of PM_{10} indicates that the PM_{10} objectives for 2004 will not be exceeded at any roads or junction in Fife. Though the estimated concentrations for PM_{10} are close to the 2010 annual average objective for PM_{10} at many roads and junctions there were no predicted exceedences of this objective.

There are no domestic or industrial sources that are likely to cause an excedence of the Air Quality Objectives for PM_{10}.

Hence, a detailed assessment is not required for PM_{10}.

11 Conclusions

This Updating and Screening report has followed the guidance set in Part IV of the Environment Act 1995 Local Air Quality Management LAQM.PRG(03) to ensure continuity in the LAQM process. The following conclusions arise from the findings in this report:

11.1 CARBON MONOXIDE

The results of 9-months of carbon monoxide monitoring at Admiralty Road, Rosyth, and the short-term monitoring undertaken by the Transportation Department indicate that CO concentrations are well below objective set. There are no roads in Fife which require further screening according to the criteria in the technical guidance. There are no new industrial processes, road or other developments that require detailed assessment with respect to this pollutant. Hence, a detailed assessment is not required for carbon monoxide.

11.2 BENZENE

Results of the ongoing air quality monitoring studies for Innovene and BP indicate that ambient concentrations of benzene in Fife meet the Air Quality Strategy Objective. There are no new industrial processes, roads, petrol stations or other developments that require detailed assessment for this pollutant. Hence, a detailed assessment is not required for benzene.

11.3 1,3-BUTADIENE

Results of ongoing air quality monitoring study for Innovene indicate that ambient concentrations of 1,3-butadiene in Fife meet the Air Quality Strategy Objective. There are no new industrial processes, roads, or other developments that require detailed assessment for this pollutant. Hence, a detailed assessment is not required for 1,3-butadiene.

11.4 LEAD

No ambient monitoring for lead is carried in Fife. However, the emissions of lead from industrial processes are unlikely to lead to an exceedence of the objectives for lead. There are no new industrial processes or other developments that require detailed assessment for this pollutant. Hence, a detailed assessment is not required for lead.

11.5 NITROGEN DIOXIDE

Measurements of NO_2 at the automatic monitoring sites at Kincardine North Approach Road and at Admiralty Road, Rosyth indicate that NO_2 concentrations will meet the Air Quality Strategy Objective for NO_2 these sites. Initial results at the new automatic monitoring site in Bonnygate, Cupar indicate that concentrations at this may approach the objective and this is confirmed by the diffusion tube results in this area.

Of those diffusion tubes located in areas relevant for exposure (i.e. not at kerbside locations) only one other site - Appin Crescent, Dunfermline – has concentrations that approach (but do not exceed) the NO_2 objective.

Screening of roads and junctions throughout Fife indicates that there is unlikely to be any exceedence of the NO_2 Air Quality Objective.

There are no industrial processes or planned developments that are likely to lead to an exceedence of the NO_2 objective.

Fife Council are already proactively investigating the areas of elevated NO_2 concentrations identified by monitoring with additional diffusion tubes - deployed in April 2006 - and the establishment of the automatic monitoring station in Bonnygate.

A detailed assessment is not required for nitrogen dioxide.

11.6 SULPHUR DIOXIDE

Monitoring of sulphur dioxide by automatic monitoring, Smoke and SO_2 network monitoring and diffusion tubes indicate that the air quality objectives for SO_2 are met in Fife. There are no industrial processes or planned developments that are likely to lead to an exceedence of the SO_2 objective. Hence, a detailed assessment is not required for sulphur dioxide.

11.7 PM10

The monitoring of PM_{10} at Admiralty Road, Rosyth indicates that the 2004 air quality objectives for PM_{10} are met at this location. However, projecting measured concentrations forward to 2010 indicates that the 2010 Objective may be closely approached. Initial data for the Bonnygate site indicates the same situation for the 2004 Objective, but more likelihood of an exceedence of the 2010 Objective. As Fife Council plan to undertake more monitoring at Admiralty Road and Bonnygate, no further assessment is required at this time. However, it is recommended that a full year of monitoring be undertaken at both sites.

The DMRB screening assessment of roads and junctions in Fife shows estimated concentrations well below the 2004 PM_{10} Air Quality Objective and also below the 2010 PM_{10} Objective.

There are no significant domestic or industrial sources of PM_{10}.

Hence, a detailed assessment is not required for PM_{10}.

11.8 SUMMARY

Monitoring of NO_2 and PM_{10} needs to continue at the Bonnygate, Cupar and Admiralty Road, Rosyth to better assess ambient concentrations.

Screening modelling indicates no exceedences of any Air Quality Objectives for any of the Air Quality Strategy Pollutants.

Fife Council accepts the above conclusions and will implement the recommendations.

12 References

[1] Scottish Executive - Part IV of the Environment Act 1995. Local Air Quality Management, Revised Policy Guidance Feb 2003 Paper 2003/2

[2] Part IV of the Environment Act 1995. Local Air Quality Management. Technical Guidance LAQM.TG(03) January 2003.

[3] Air Quality Updating and Screening Assessment for Fife Council. AEAT/ENV/R/1494. August 2003.

[4] Air Quality Review and Assessment Progress Report for Fife Council. AEAT/ENV/R/1678 Issue 2. July 2004

[5] Air Quality Review and Assessment Progress Report for Fife Council 2004/2005. AEAT/ENV/R/1955 Issue 2. Jun 2005

[6] KC Blakeley et al, Ambient Atmospheric Survey in the Vicinity of Grangemouth for 2004-2005, NPL report reference 106505/QT031\04_05 October 2005.

[7] Mossmorran and Braefoot Bay Independent Air Quality Monitoring Review Group – 2004 Annual Report. September 2004.

[8] Black J.K. et al Ambient Atmospheric Survey for Hydrocarbons in the Vicinity of Hound Point – Annual Survey 2004 – 2005. NPL reference 106608/QT03E0710405 Feb 2006.

[9] RWE Power International. Review of Annual Air Quality Impacts around Longannet Power Station compared to Air Quality Objectives – Calendar Year 2005 Ref ENV/130/206

[10] Finalised Fife Structure Plan. Environment and Development Committee Version – April 2006.

13 Acknowledgments

The author would like to acknowledge the help of Kenny Bisset, Environmental Health Officer, Fife Council Environmental Services and Blyth Berwick, Lead Officer, Fife Council Transportation Services for their contributions to this report.

Appendices

CONTENTS

Appendix 1
DIAGRAMS OF NEW SITE LOCATIONS

CONTENTS

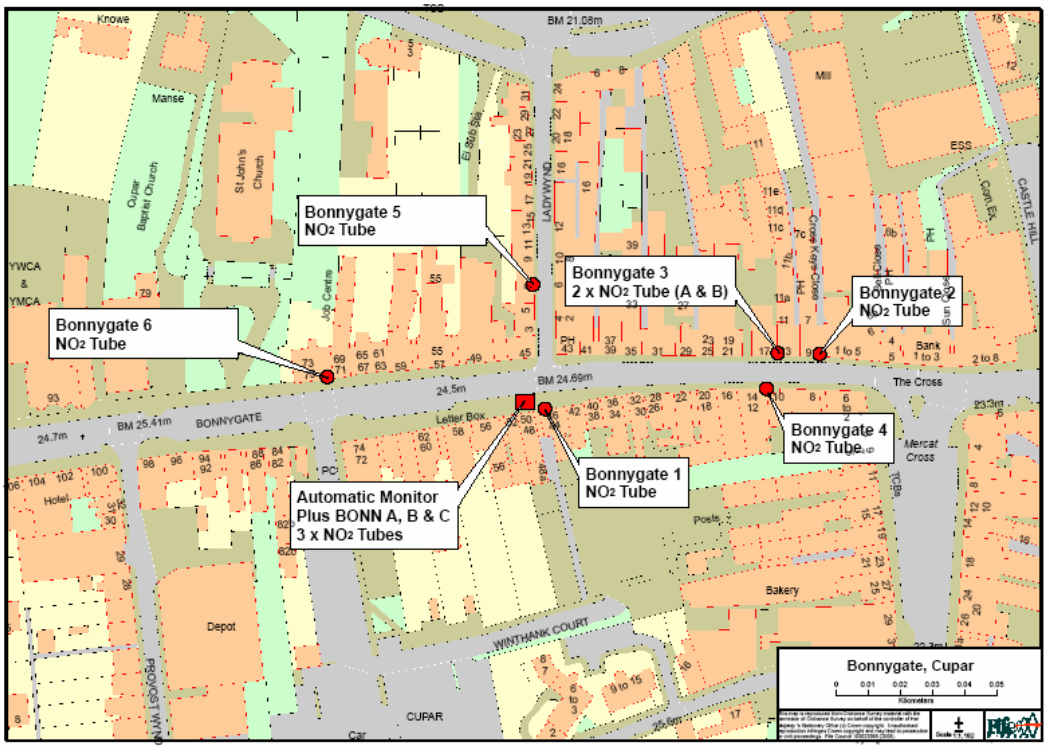
Bonnygate Cupar

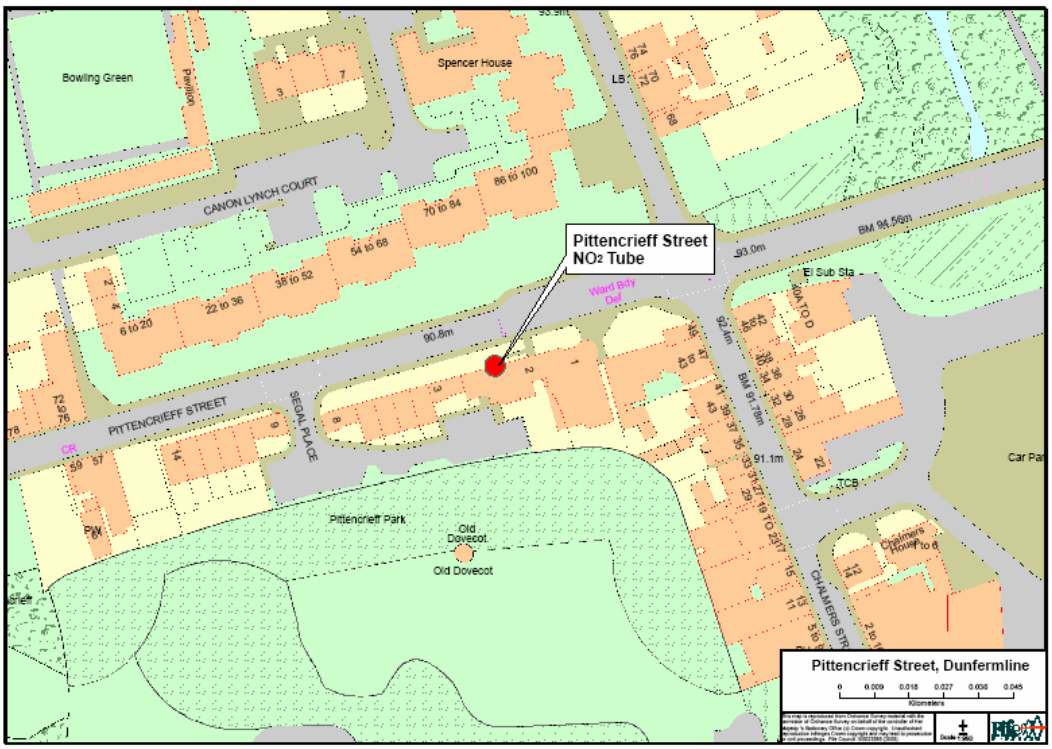
Pittencrieff Street,Dunfermline

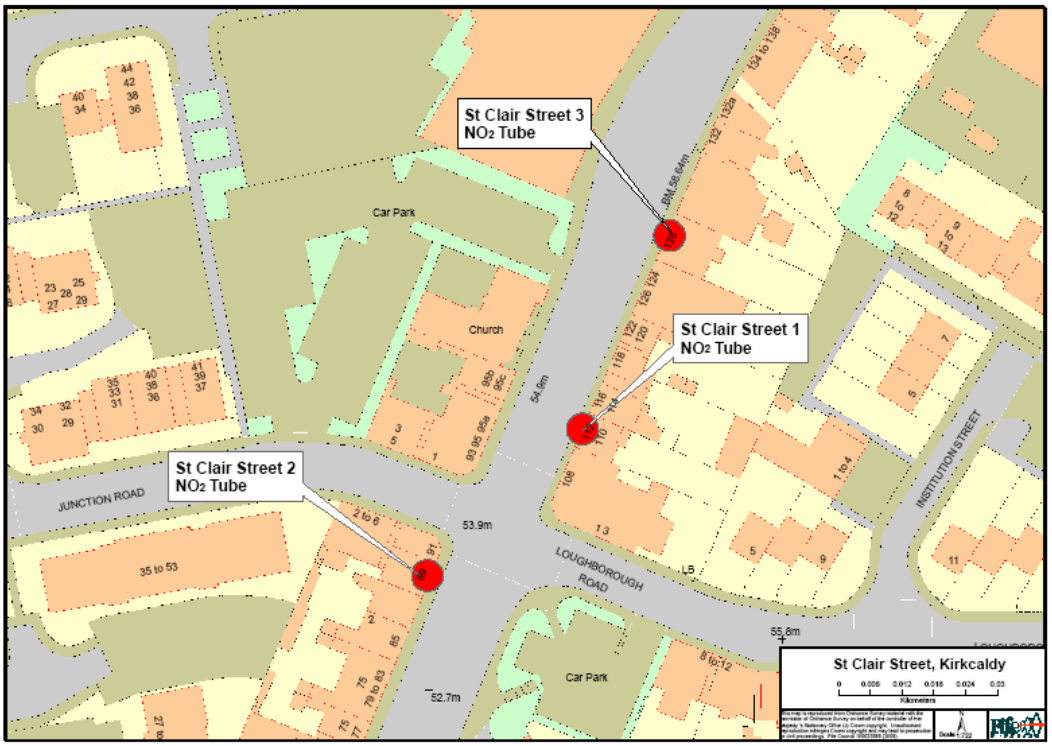
St.Clair Street,Kirkcaldy

Appin Crescent,Dunfermline

Maps reproduced within this document


Bonnygate 5
NO2 Tube
Bonnygate 3
2 x NO2 Tube (A & B)
Bonnygate 2
NO2 Tube
Bonnygate 6
NO2 Tube
Bonnygate 4
NO2 Tube
Automatic Monitor
Plus BONN A, B & C
3 x NO2 Tubes
Bonnygate 1
NO2 Tube
BONNYGATE
WINTHANK COURT
CUPAR
The Cross
Bonnygate, Cupar


Pittencrieff Street
NO2 Tube
PITTENCRIEFF STREET
CANON LYNCH COURT
SEGAL PLACE
Pittencrieff Park
Old Dovecot
CHAMBERS STR
Pittencrieff Street, Dunfermline


St Clair Street 3
NO2 Tube
St Clair Street 1
NO2 Tube
St Clair Street 2
NO2 Tube
Car Park
Church
JUNCTION ROAD
LOUGHBOROUGH ROAD
INSTITUTION STREET
53.9m
52.7m
55.6m
St Clair Street, Kirkcaldy


Appin Crescent
NO2 Tubes (x3: A, B & C)
Appin Crescent 1
NO2 Tube
Appin Crescent 2
NO2 Tube
Appin Crescent 3
NO2 Tube
LEYS PARK ROAD
Car Park
Pippies Lane
APPIN CRESCENT
TRANSY GROVE
86.3m
89.9m
Appin Crescent, Dunfermline

Appendix 2
DETAILED INFORMATION ON AUTOMATIC MONITORING LOCATIONS

CONTENTS

North Approach Road, Kincardine:

Station Name:	North Approach Rd, Kincardine
Site Owner/operator:	Fife Council/Dundee Scientific Services
Northing:	293191
Easting:	687518
Zone/agglomeration:	
Site Classification:	Roadside (4m from kerb)
Manifold type and height:	Fan manifold, 3m
Network affiliation:	None
Quality control procedures:	Daily calibration with BOC cylinders
Pollutants measured on site:	NOx, NO, NO_2
Instrument manufacturer:	Monitor Europe ME 9841B
Calibration procedure and frequency:	Daily calibration with BOC Spectaseal cylinders (450ppb NO)
Site service arrangements:	Casella
Co-located passive sampler Comments:	Triplicate NO_2 tubes installed

Admiralty Road, Rosyth

Station Name:	Groundhog, Admiralty Road, Rosyth
Site Owner/operator:	Fife Council/Dundee Scientific Services
Northing:	311752
Easting:	683515
Zone/agglomeration:	
Site Classification:	Roadside (7/8m from kerb)
	Inlet at building facade
Manifold type and height:	Fan manifold, 3m
Network affiliation:	None
Quality control procedures:	Daily calibration with BOC cylinders
Pollutants measured on site:	NOx, NO NO_2 SO_2 CO PM10 Met
Instrument manufacturer:	NOx – ME 9841B SO_2 – ME9850B CO – ME9830B PM10 – TEOM 1400a
Calibration procedure and frequency:	Daily calibration with BOC Spectaseal
	cylinders (NO 450ppb, SO_2 450ppb, CO
	20ppm, zero air)
Site service arrangements:	Casella
Co-located passive sampler	Triplicate NO_2 tubes installed
Comments:	50yds from road junction

Bonnygate
Cupar, Fife

Station Name:	Bonnygate, Cupar
Site Owner/operator:	Fife Council/Dundee Scientific Services
Easting:	337401
Northing:	714572
Altitude:	
Zone/agglomeration:	(Netcen will provide this)
Site Classification:	Kerbside (<1m from Kerb)
Distance to kerb and road name/number	0.5m to Bonnygate (A91)
Distance to nearest junction and joining road name/number	Opposite the junction with Ladywynd
Start date of monitoring	19 December 2005
Manifold type and height:	Single Teflon tube, Inlet height 1.7m
Network affiliation:	None
Quality control procedures:	Calibration with Air Liquide gas cylinder
Pollutants measured on site:	PM10 (TEOM) NOx, NO, NO_2
Instrument manufacturer:	TEOM – R and P NOx -
Calibration procedure and frequency:	2-wekly manual calibration
Site service arrangements:	6-monthly service by Air Monitors
Co-located passive sampler	Triplicate NO_2 tubes installed
Comments:	

Appendix 3
SEPA POLLUTION REGISTER FOR FIFE

CONTENTS

SEPA PART B PPC Application Database

PPC NUMBER	APPLICANT	SITE LOCATION ADDRESS 1	LOCATION ADDRESS 2	LOCATION ADDRESS 3	RELEVANT LICENCES	PROCESS DESCRIPTION
PPC/E/30001	Exxon Mobil	Esso Petrol Station	Broxden	Perth		Unloading of petrol in stationary storage tanks at a service station
PPC/E/30002	Malthurst Ltd	Links Service Station	21-37 Barclay Place	Bruntsfield , Edinburgh	APC/E/20160	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30003	Sainsbury's Supermarkets Ltd	Savacentre Ltd	Cameron Toll Centre	Lady Road, Edinburgh, EH16 4TH	APC/E/20191	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30004	Asda Stores Ltd	Asda Edinburgh PFS	100 The Jewel	Brunstane, Edinburgh, EH15 3AR	APC/E/20238	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30005	Shell UK Oil Products Ltd	Shell Stenhouse	1 Stenhouse Road	Edinburgh, EH11 3LW	APC/E/20250	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30006	Shell UK Oil Products Ltd	Shell Leith Walk	35-40 Haddington Place	Edinburgh, EH7 4AG	APC/E/20252	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30007	Shell UK Oil Products Ltd	Shell Dreghorn	50 Dreghorn Link, City By-Pass	Edinburgh, EH13 9QR	APC/E/20260	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30008	Esso Petroleum Co Ltd	Dalryple Service Station	Direlton Road	North Berwick, East Lothian, EH19 5DF	APC/E/20273	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30009	Lothian Borders & Angus Co-operative Society Ltd	Lothian Borders & Angus Co-operative Petrol Filling Station	141 High Street	Tranent, EH33 1AA	APC/E/20274	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30010	Shell UK Oil Products Ltd	Shell Braidburn	277 Comiston Road	Edinburgh, EH10 6AP	APC/E/20290	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30011	Shell UK Oil Products Ltd	Shell Musselburgh	Edinburgh Road	Musselburgh, EH21 6DN	APC/E/20299	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30012	Shell UK Oil Products Ltd	Shell Craigleith (2041)	139 Craigleith Road	Edinburgh, EH4 2EH	APC/E/20301	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30013	Arnold Clark Automobiles Ltd	527 Queensferry Road	Barton	Edinburgh, EH4 7QD	APC/E/20304	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30014	Esso Petroleum Co Ltd	Little France Service Station	Old Dalkeith Road	Edinburgh, EH16 4SU	APC/E/20308	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30015	Esso Petroleum Co Ltd	Canonmills Service Station	23 Carronmills	Edinburgh, EH3 5HA	APC/E/20309	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30016	Esso Petroleum Co Ltd	Lothianburn Service Station	Biggar Road	Edinburgh, EH10 7DU	APC/E/20316	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30017	Esso Petroleum Co Ltd	Thimblehall Service Station	23 Lanark Road	Edinburgh, EH14 4TG	APC/E/20327	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30018	Esso Petroleum Co Ltd	Firrhill Service Station	Colinton Mains Drive	Edinburgh, EH13 9AB	APC/E/20328	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30019	Shell UK Oil Products Ltd	Shell Easthouses	Mayfield Road	Dalkeith, EH22 4DN	APC/E/20332	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30020	Shell UK Oil Products Ltd	Shell Dalry	209 Dalry Road	Edinburgh, EH11 2EF	APC/E/20333	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30021	Star Service Stations	Calder Road	511 Calder Road	Edinburgh, EH11 4AR	APC/E/20348	Unloading of petrol in stationary storage tanks at a service station

PPC/E/30022	Safeway Stores Plc	Safeway Petrol Station	4 Piersfield Terrace	Portebello, Edin-burgh, EH8 7BQ	APC/E/20349	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30023	Esso Petroleum Co Ltd	Granada Musselburgh	Musselburgh By-pass	East Lothian, EH21 8RE	APC/E/20355	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30024	Safeway Stores Plc	Safeway Petrol Station	Gyle Shopping Centre	South Gyle Broadway, Edinburgh, EH12 9GU	APC/E/20359	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30025	Esso Petroleum Co Ltd	Windmill Service Station	109 Queensferry Road	Edinburgh, EH4 3HL	APC/E/20362	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30026	Star Service Stations Limited	Roseburn	8 Kew Terrace	Edinburgh, EH2 5SE	APC/E/20363	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30027	John Sommerville Services Ltd	BP Drumbrae	35 Drumbrae South	Edinburgh, EH12 8DT	APC/E/20402	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30028	G M Mining Limited	Kingslaw OCCS	Randolph Road	Kirkcaldy	N/A	Crushing, grinding,screening,grading,mixing,loading and unloading of coal
PPC/E/30029	Esso Petroleum Co Ltd	Edinburgh Express	Willowbrae Road	Edinburgh, EH8 7NG	APC/E/20310	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30030	Kenneth Cardler	Bavelaw Garage	46 Bavelaw Road	Balerno		combustion process
PPC/E/30031	Havelock Europa plc	Westway	Hillend Ind Park	Dalgety Bay, Fife		timber process
PPC/E/30032	Havelock Europa plc	Telford Building, Block 1	Muirton Way, Donibristle Ind Est	Dalgety Bay, Fife		wood coating process
PPC/E/30033	Tarmac Northern Ltd	Westwood Road	Westwood	Livingston	APC/E/110	Blending cement in bulk or using cement in bulk, including bagging of cement and cement mixtures, the batching of ready mixed concrete and the manufacture of concrete blocks and other cement products
PPC/E/30034	Lothian Trailer Centre	Tranmere Service Station	Haddington Road	Tranent, EH33 1DZ	APC/E/20338	Unloading of petrol in stationary storage tanks at a service station
PPC/E/30035	Belliston Quarry Co Ltd	MOBILE			APC/E/20020 - REVOKED	mobile crushing & screening process
PPC/E/30036	Cults Lime Ltd	Limehills, Pitlessie	Ladybank	Fife KY7 7TF	APC/E/415 - REVOKED	mineral process
PPC/E/30037	ABN (Scotland) Ltd	Damside Mill	Cupar Muir, Cupar	Fife KY15 5ZA	APC/E/494	ref number cancelled - part A process
PPC/E/30038	Sanmina - SCI Enclosure Systems Ltd	Mitchelston Ind Est	Kirkcaldy	Fife KY1 3NA	APC/E/20279 - REVOKED	powder coating process
PPC/E/30039	Deans Foods Ltd	Strathore Mill	Thornton	Fife KY1 4DX	APC/E/493	animal feed compounding process
PPC/E/30040	Fife Joinery Manufacturing Ltd	Telford Road	Glenrothes	Fife KY7 4NX	APC/E/20193 - REVOKED & APC/E/481 - REVOKED	wood coating, timber process
PPC/E/30041	Heil Europe Ltd	Hillend Ind Park	Dunfermline	Fife KY11 5JT	APC/E/469 - REVOKED	metal coating process
PPC/E/30042	Rbt Hutchison of Sandy Brae SS	Sandy Brae Service Stn	Sandy Brae	Kennoway KY8 5JN	APC/E/20208 - REVOKED	petroleum
PPC/E/30043	Hall Construction Services Ltd	Thornton Sidings	Redford	Kirkcaldy, Fife	APC/E/20411 - REVOKED	coal handling process
PPC/E/30044	Errol Brick Co Ltd	Errol Brickworks	Inchcoonans Road	Errol, Perthshire PH2 7RB	APC/E/513 - REVOKED	Withdrawn - changed to Part A Permit application
PPC/E/30045	Elder & Paton	Arran Road	Perth	PH1 3DZ	APC/E/535 & 550 REVOKED	Coating (vehicle respraying) & Combustion (WOB)

PPC/E/30046	Concrete Products (Kirkcaldy) Ltd	Hayfield Place	Hayfield Industrial Estate	Kirkcaldy, Fife, KY2 5DH	APC/E/398 - REVOKED	cement process
PPC/E/30047	Alan Samson Motors	1 Terminus Street	Blairgowrie	PH10 6NW	APC/E/20409 - REVOKED	combustion
PPC/E/30048	Palco Shipping & Trading Ltd, T/A CPL Calport	CPL Calport	The Harbour	Perth PH2 8BB	APC/E/522 - REVOKED	mineral process
PPC/E/30049	RMC Readymix Ltd	Craighead Quarry	Cardenden	Fife KY5 OHE	APC/E/399 - REVOKED	cement process
PPC/E/30050	Ennstone Thistle Ltd	Melville Gates	Ladybank	Cupar KY15 7RF	APC/E/20033 - REVOKED	cement process
PPC/E/30051	RMC Readymix Ltd	Dock Street	Dundee	DD1 3SS	APC/E/333	cement process
PPC/E/30052	Ennstone Thistle Ltd	Ethiebeaton Quarry	Monifieth, Dundee	DD5 3RB	APC/E/336 - REVOKED	rock crushing process
PPC/E/30053	Ennstone Thistle Ltd	Cunmont Quarry	Newbigging, Angus	DD5 3PX	APC/E/343 - REVOKED	roadstone coating process
PPC/E/30054	Brown & Tawse Steelstock Ltd	Fowler Road	West Pitkerro Industrial Estate	Dundee DD5 3YN	APC/E/363 - REVOKED	coating of metal process
PPC/E/30055	Richard Lawson Autologistics Ltd	Hillhead, Northmuir	Kirriemuir	Angus DD8 4PB	APC/E/378 - REVOKED	respraying of road vehicles process
PPC/E/30056	D Geddes (Contractors) Ltd	Ardownie Quarry	Monifieth	Dundee	APC/E/587	cement batching process
PPC/E/30057	Brothock Coachworks	Peasiehill Road	Elliot Industrial Estate	Arbroath DD11 2NJ	APC/E/20427 - REVOKED	vehicle respraying process
PPC/E/30058	Gemini Corrosion Services Ltd	Brent Avenue,	Forties Road Industrial Estate	Montrose DD10 9PB	APC/E/20412 - REVOKED	metal coating process
PPC/E/30059	D Geddes (Contractors) Ltd	Waulkmill Quarry	Inverkeilor	Angus	APC/E/306 - REVOKED	roadstone coating process
PPC/E/30060	Rosehill Timber	Clearymoor Sawmill	Rosehill	Northwater Bridge AB30 1QD	APC/E/312 - REVOKED	timber treatment process
PPC/E/30061	Armitages Pet Products Ltd t/a Wilson's of Dundee	Caledonian Mills	Stannergate	Dundee DD1 3NN	APC/E/365 - REVOKED	drying of grain process
PPC/E/30062	RMC Readymix Ltd	Newton Hill	Wormit	Newport on Tay DD6 8RL	APC/E/400 - REVOKED	cement process
PPC/E/30063	Skene Group Ltd	Phoenix Works	Crossgates	Dunfermline, KY4 8HF	APC/E/407 - REVOKED	cement process
PPC/E/30064	Tarmac Northern Ltd	Hayfield Road	Hayfield Industrial Estate	Kirkcaldy KY2 5DH	APC/E/411 - REVOKED	cement process
PPC/E/30065	Ennstone Thistle Ltd	Lucklawhill Quarry	Balmullo	Fife KY16 OBF	APC/E/437 - REVOKED	mineral process
PPC/E/30066	Aggregate Industries UK Ltd	Penston Road Depot	Gladsmuir	East Lothian	APC/E/6	Batching of ready mixed concrete
PPC/E/30067	Tarmac Northern Ltd	Spott Road Industrial Estate	Dunbar	East Lothian	APC/E/7	Batching of ready mixed concrete
PPC/E/30068	Tarmac Northern Ltd	Catewell Quarry	Cousland	Dalkeith	APC/E/151	Batching of ready mixed concrete
PPC/E/30069	Tesco Stores Ltd	Kingsway	Dundee	DD3 8QB		petroleum process
PPC/E/30070	David Ritchie (Implements) Ltd	Carseview Road	Forfar	DD8 3BT	APC/E/313 - REVOKED	metal coating process
PPC/E/30071	Alfred Lawrie of Central Garage	74 High Street	Laurencekirk	AB30 1BJ	APC/E/320 - REVOKED	combustion process
PPC/E/30072	Roger Hogg of Mearns Tractors	Alma Place	Laurencekirk	AB30 1AL	APC/E/322 - REVOKED	combustion process
PPC/E/30073	Howie Minerals Limited	Middleton Limeworks	Middleton,	Midlothian, EH23	APC/E/154	Crushing, grinding or other size reduction or the grading, screening or heating of any designated mineral or mineral product

			Gorebridge	4QP		
PPC/E/30074	Tarmac Northern Ltd	14 Castle Road	Bankdside Industrial Estate	Falkirk, FK2 7UY		Storing, loading or unloading of cement in bulk prior to further transportation in bulk
PPC/E/30075	Scotland Gas Network	Scotland Gas Network	Pitcairngreen	Perth	APC/E/20431 - REVOKED	gas odourisation process
PPC/E/30076	Sandusky Ltd	Viewfield Ind Estate	Glenrothes	Fife KY6 2RQ	APC/E/391	iron and steel process
PPC/E/30077	Drummond Motor Co Ltd	Ferrard Road	Kirkcaldy	Fife KY2 5RZ	APC/E/474 - REVOKED	respraying of road vehicles
PPC/E/30078	Tarmac Northern Ltd	Cruicks Quarry	Inverkeithing	Fife KY11 1HH	APC/E/426 - REVOKED	mineral process
PPC/E/30079	Craig & Rose plc	Unit 8, Halbeath Industrial Estate	Crossgates Road, Halbeath	Dunfermline, Fife, KY11 7EG	APC/E/20433 - REVOKED	coating process
PPC/E/30080	Daltons Demolitions Ltd	n/a - mobile plant				Mobile Plant
PPC/E/30081	Skene Group Ltd	Mobile Plant			APC/E/20024 - REVOKED	Mobile screening and crushing process
PPC/E/30082	Shell Gas Limited	North Access Road	Cowdenbeath	Fife KY4 8EP	APC/E/585 - REVOKED	liquid odorant process
PPC/E/30083	Henry Gray & Sons	Henry Gray & Sons	Randolph Ind Estate	Kirkcaldy KY1 2YX	APC/E/395 - REVOKED	non-ferrous metal process
PPC/E/30084	Skene Group Ltd	Skene Group Ltd	Mobile		APC/E/20423 - REVOKED	Mobile cement batching plant process
PPC/E/30085	Clydeport Ltd	Rosyth Coal Handling Facility	Rosyth	Fife		coal handling process
PPC/E/30086	Aggregate Industries UK Ltd	Perth Readymix Plant	Unit 9 Inver-almond Ind Estste	Perth		batching of ready mixed concrete
PPC/E/30087	Aggregate Industries UK Ltd	Edzell Readymix Plant	Arnhall Sand & Gravel Quarry	Edzell		
PPC/E/30088	Thomas Muir Metals Ltd	Dunnikier Works	Den Road	Kirkcaldy KY1 2ER	APC/E/397 - REVOKED	aluminium process
PPC/E/30089	Tayblast Services Ltd	Lunan Bay	Montrose	DD10 9TG	APC/E/318 - REVOKED	coating process
PPC/E/30090	Mr P Meston of Careston Motors	Careston Motors	Careston	Brechin DD9 6RX	APC/E/324 - REVOKED	combustion process (WOB)
PPC/E/30091	Airlie Estates of Cortachy	Cortachy	Kirriemuir	Angus	APC/E/323 - REVOKED	combustion process (WOB)
PPC/E/30092	D F & A Collie	59 Clerk Street	Brechin	Angus	APC/E/327 - REVOKED	combustion process (WOB)
PPC/E/30093	Fleet Finish Ltd	Carseview Road	Suttieside Industrial Estate	Forfar	APC/E/314 - REVOKED	respraying of commercial vehicles process
PPC/E/30094	Holden Environmental Ltd	Shore Road	Perth	PH2 8BH	N/A	Mobile Plant
PPC/E/30095	Mr Alan Dougan of The Station	The Station	Auchterarder	PH3 1PF	APC/E/540 - REVOKED	respraying of road vehicles process
PPC/E/30096	RJT Excavations Ltd	n/a - mobile plant			APC/E/20477	Mobile Plant
PPC/E/30097	Dunfermline Autocentre Ltd	Halbeath Road	Dunfermline	KY12 7RD	APC/E/477 - REVOKED	Refinishing of road vehicle
PPC/E/30098	T H Fergusson & Co Ltd	12 Whitehouse Road	Springkerse Ind Est	Stirling FK7 7SS	APC/E/567	coal, coke & coal products (other mineral process)
PPC/E/30099	Morrisons Garage Ltd	Whins of Milton	Stirling	FK7 8HQ	APC/E/577	road vehicle respraying process (coating processes & printing)
PPC/E/30100	Tesco Stores Ltd	Central Way	Town Centre	Cumbernauld, G67 1NG		Unloading of petrol in stationary storage tanks at a service station

PPC/E/30101	Forfar Galvanisers Ltd	Carseview Road	Forfar	Angus DD8 3EE	APC/E/20435 - REVOKED	galvanising
PPC/E/30102	The L S Starrett Co Ltd	Oxnam Road Industrial Estate	Jedburgh	TD8 6LR	APC/E/20183	
PPC/E/30103	Falkirk Council	Inchyra Road	Inchyra Depot	Grangemouth FK3 9XB		
PPC/E/30104	Walter A Crole & Son	Jessie Street	Blairgowrie	PH10 6BT	APC/E/537 - REVOKED	vehicle respraying
PPC/E/30105	G Mutch Mechanical Services	Shore Road	Perth	PH2 8BH	APC/E/538 - REVOKED	coating
PPC/E/30106	Cameron Motors (Perth) Ltd	166 Dunkeld Road	Perth	PH1 5AS	APC/E/534 - REVOKED	coating
PPC/E/30107	John R Weir Ltd	172-174 Dunkeld Road	Perth	PH1 3XL	APC/E/536 - REVOKED	vehicle respraying
PPC/E/30108	CPL Industries t/a CPL Distribution	Forward Landsale Site	Monktonhall Colliery	Newton Village, Dalkeith, EH22 1SE	APC/E/149	Coal handling
PPC/E/30109	Petersmuir Sawmills	Petersmuir Sawmills	Haddington	East Lothian, EH42 4JR	APC/E/2	Timber Process
PPC/E/30110	Stowe Woodward Ltd	Viewfield Industrial Estate	Glenrothes	KY6 2RG	APC/E/490 - REVOKED	rubber
PPC/E/30111	Tarmac Northern Ltd	Bangley Quarry	Haddington	EH41 3SN	APC/E/8	coating
PPC/E/30112	Palco Shipping & Trading Ltd, T/A CPL Calport	The Calport Store	Shore Road	Perth	APC/E/544 - REVOKED	fishmeal storage
PPC/E/30113	ST Services Ltd	Imperial Dock	Leith	Edinburgh, EH6 7DR	APC/E/20399	Petroleum process
PPC/E/30114	The North British Distillery Company Limited	9 Wheatfield Road	Edinburgh	EH11 2PX	APC/E/209	processing of animal/vegetable matter
PPC/E/30115	Windymains Sawmill Ltd	Windymains	Humbie	East Lothian, EH436 5PA	APC/E/3	Timber Activities
PPC/E/30116	Aggregate Idustries Ltd	Hillwood Quarry	Ratho	Mid Lothian	APC/E/132	Production of cement & lime
PPC/E/30117	CEMEX UK Materials Limited	Craigpark Quarry	Ratho	Mid Lothian	APC/E/138	Production of cement & lime
PPC/E/30118	Cebotec Limited	Dalgrain Industrial Estate	Grangemouth	FK3 8EB	APC/E/20367	Coating Activities, Printing and Textile Treatments
PPC/E/30119	Duddingston Coachworkds Ltd	34 West Telferton Road	Edinburgh	EH7 6UL	APC/E/225	Coating Activities, Printing and Textile Treatments
PPC/E/30120	David Morton (Larbert) Limited	n/a - mobile plant			APC/E/20292	Mobile plant
PPC/E/30121	Bill Stephen Motors Ltd	Golf View	Cookston Road	Brechin DD9 7QU	APC/E/20454 - REVOKED	combustion
PPC/E/30122	The Scottish Coal Company Ltd	Newbigging OCCS	By Rosewell	Edinburgh		Other mineral activities
PPC/E/30123	Kingdom Coachworks Ltd	85a Dunnikier Road	Kirkcaldy	KY1 2QW	APC/E/20462 - REVOKED	combustion
PPC/E/30124	William Drummond of Shore Garage	Shore Garage	Back Dykes, East Wemyss	Kirkcaldy, KY1 4RY	APC/E/20459 - REVOKED	combustion
PPC/E/30125	Skene Group Ltd	MOBILE			APC/E/20468 - REVOKED	Mobile plant
PPC/E/30126	Eastern Western Motor Group Ltd	8 Westerton Road	Broxburn	West Lothian		Coating Activities, Printing and Textile Treatments
PPC/E/30127	John Martin Group Ltd	3 Salters Road	Wallyford	EH21 8JY	APC/E/9	
PPC/E/30128	R J T Excavations Ltd	n/a - mobile plant			APC/E/20477 & PPC/E/30096	Mobile plant
PPC/E/30129	Hall Construction Services Ltd	Rosebank Mains OCCS	Drumtuthill Road	Dunfermline		Crushing, grinding,screening,grading,mixing,loading and unloading of coal

PPC/E/30130	Central Blasting & Painting Ltd	Whitecross Industry Park	Near Linlithgow	West Lothian	APC/E/0120019	The application of coating material to metal
PPC/E/30131	Farnbeck Limited	32 Swanfield	Bonnington Road	Leith, Edinburgh, EH6 5RX	APC/E/224	Application of rubber compounds to textile base using a knife over roller system and subsequent curing by heating
PPC/E/30132	J Fenton & Sons (Contractors) Ltd	n/a - mobile plant				Handling coal/coal products
PPC/E/30133	Finnforest BBH Ltd	Creosote Works,	Kirkland	Leven KY8 4TH	APC/E/487 - REVOKED	Timber & Timber Treatment Process
PPC/E/30134	Arnold Clark - Tollcross	Lochrin Place	Tollcross	Edinburgh EH3 9QN	APC/E/227	The repaining or re-spraying of road vehicles or parts thereof
PPC/E/30135	Patersons of Greenoakhill Limited	Precon Blocks	Blackburn Road, Bathgate	West Lothian, EH48 2EB	APC/E/114	Blending cement in bulk or using cement in bulk, including the bagging of cement and cement mixtures, the batching of ready mixed concrete blocks andother cement products
PPC/E/30136	Scotcem Rooftiles Limited	Newbridge Industrial Estate	Newbridge	Edinburgh, EH28 8PJ	APC/E/135	Blending cement in bulk or using cement in bulk, including the bagging of cement and cement mixtures, the batching of ready mixed concrete blocks andother cement products
PPC/E/30137	W M Morrison Supermarkets Plc Petrol Station	Hope Street	Falkirk			Storing, loading or unloading of cement in bulk prior to further transportation in bulk
PPC/E/30138	Ennstone Thistle Ltd	Mobile			APC/E/20417	Mobile
PPC/E/30139	Ennstone Thistle Ltd	Mobile			APC/E/20419	Mobile
PPC/E/30140	Somerfield Stores Ltd	Abercraig Filling Station	Newport on Tay	DD5 3RB	APC/E/20128 - REVOKED	petroleum
PPC/E/30141	RMC Concrete Products (UK) Ltd	Westwood Works	Westwood	West Calder, West Lothian, EH55 8PW	APC/E/109	Blending cement in bulk or using cement in bulk, including the bagging of cement and cement mixtures, the batching of ready mixed concrete blocks andother cement products
PPC/E/30142	Spray Colour Technologies	6 Boston Road	Glenrothes, KY6 2RE			
PPC/E/30143	Tesco Stores Ltd	South Road	Cupar, Fife		APC/E/20067 - REVOKED	Petroleum
PPC/E/30144	Abbey Garage	Abbey Garage	Cupar Road	Newburgh, Fife	APC/E/20494 - REVOKED	Petroleum
PPC/E/30145	Tesco Stores Ltd				APC/E/20430	
PPC/E/30146	William Morrison Supermarkets Plc	Gilmerton Road	Edinburgh	Midlothian	APC/E/20436	
PPC/E/30147	Tesco Stores Ltd	Bonnyrigg Road	Hardengreen	Dalkeith	APC/E/20439	
PPC/E/30148	Star Service Stations					
PPC/E/30149	Tesco Stores Ltd				APC/E/20460	Petroleum
PPC/E/30150	Keyline Builders Merchants	1 Baltic Street	Leith	Edinburgh, EH6 7BR	APC/E/172	
PPC/E/30151	VZS-Seagoe Advanced Ceramics Ltd	35-37 Cavendish Way	Southfield Industrial Estate	Glenrothes, KY6 2SB	APC/E/20016 - REVOKED	Ceramic process
PPC/E/30152	Gordon Curtis Motors Ltd	3 Carnock Road	Milesmark, Dunfermline	KY12 9NT	APC/E/476	refinishing of road vehicle process
PPC/E/30153	Core Products	Mitchell Building	Woodside Way	Glenrothes KY7 4ND	APC/E/20463 - REVOKED	timber process
PPC/E/30154	The Moredun Foundation	Pentlands Science Park	Bush Loan	Penicuik	APC/E/159	Incineration of animal remains
PPC/E/30155	J Fenton & Sons (Contractors) Ltd	Kincardine Power Station	Kincardine	Fife	APC/E/20035	coal process
PPC/E/30156	The Edinburgh Crystal Glass Company Limited	Polton House Works	Polton Road	Lasswade, Midlothian, EH18 1BW	N/A	glass manufacture and production process
PPC/E/30157	Joinery & Timber Creations (65) ltd	27 Harrison Road	Dundee	DD2 3SN	APC/E/374 - REVOKED	manufacture of timber and wood based products

PPC/E/30158	Sainsbury's Supermarkets Ltd	Fife Central Retail Park	Chapel Farm, Chapel Level	Kirkcaldy, Fife KY2 6TX	APC/E/20051 - REVOKED	petroleum process
PPC/E/30159	Baldoukie Motors Ltd	Baldoukie	Forfar	Angus DD8 3SN	APC/E/20471 - REVOKED	combustion
PPC/E/30160	Sainsbury's Supermarkets Ltd	Riverside Road	Leven		APC/E/20102 - REVOKED	petroleum
PPC/E/30161	G M Mining Limited	Redford Railway Sidings,	Strathore Road	Thornton, Fife	APC/E/20028 - REVOKED	coal process
PPC/E/30162	Bekaert Handling & Display Ltd	Queensway Industrial Estate	Glenrothes	KY7 5QJ	APC/E/454 - REVOKED	powder coating process
PPC/E/30163	Shell UK Ltd	Shell South Parks,	Roxburgh Road	Glenrothes	APC/E/20312 - REVOKED	petroleum
PPC/E/30164	Pillans & Waddies	Dewar Square	Deans Industrial Estate	Livingston EH54 8SA	APC/E/121	coating and printing
PPC/E/30165	Asda Stores Ltd	Carberry Road	Kirkcaldy	Fife KY1 3NG	APC/E/20148 - REVOKED	petroleum
PPC/E/30166	Shell UK Ltd	Bridge Street	St Andrews	Fife KY16 9EX	APC/E/20267 - REVOKED	petroleum
PPC/E/30167	Hanson Quarry Products Europe Ltd	Mountfleurie Works	Leven	Fife KY8 4BH	APC/E/406 - REVOKED	mineral process
PPC/E/30168	Interplex PMP Ltd	Elliot Industrial Estate	Arbroath	Angus, DD11 2NN	N/A	
PPC/E/30169	Bramall Laidlaw Limited	Baileyfield Road	Edinburgh	EH15 1BT	APC/E/222	coating process
PPC/E/30170	Border Precision Ltd	Pinnaclehill Industrial Estate	Kelso	TD5 8DW	N/A	Solvent Emissions
PPC/E/30171	United Wire Ltd	Granton Park Avenue	Edinburgh	EH5 1HT	N/A	Solvent Emissions
PPC/E/30172	Eagle Investments (UK) Ltd				N/A	Mobile Plant
PPC/E/30173	Central Demolition Limited	Chattan Industrial Estate	Bonnyside Road	Bonnybridge, FK4 2AG	N/A	Mobile Plant
PPC/E/30174	The Scottish Coal Company Ltd	St Ninians OCCS	Lassodie		APC/E/20057 - REVOKED	coal process
PPC/E/30175	R Nicol & Son	Burnside Garage	Dunning	Perth	APC/E/554	
PPC/E/30176	Gordon Motors	Comrie Road	Crieff		APC/E/546	
PPC/E/30177	H & J Burgoyne	Lightbody's Corner	Airth		APC/E/81	coating process
PPC/E/30178	CEMEX UK Materials Limited	Kinneil Quarry	by Linlithgow		APC/E/61	cement process
PPC/E/30179	I & H Brown Ltd	Mobile Plant			APC/E/20467 - REVOKED	crushing and screening
PPC/E/30180	Caledonian Alloys Limited	Wyman Gordon Complex	Houstoun Road, Houstoun Industrial Estate	Livingston	WMS/E/12 & RSA/E/038	Solvent Emissions
PPC/E/30181	Delson Contracts Ltd	Mobile			APC/E/20469	mobile plant
PPC/E/30182	Arnold Clark Automobiles Ltd	Carberry Road	Kirkcaldy	KY1 3ND	APC/E/20461 - REVOKED	respraying of road vehicles
PPC/E/30183	Empteezy Limited	Muir Road, Houston Industrial Estate	Livingston	EH45 5DR	APC/E/20446	coating & printing process
PPC/E/30184	James Donaldson Timber Ltd	Elmpark Sawmills	Leven	KY8 4PS	APC/E/20434 - REVOKED	timber process
PPC/E/30185	H & C Dickie	Mobile Plant				mobile plant
PPC/E/30186	Charles Butler Motor Engineers	Queenswell Road	Forfar	DD8 3JY	APC/E/20450	combustion
PPC/E/30187	J R Masterton & Son (Demolitions) Ltd	Mobile Plant			APC/E/20438	mobile plant
PPC/E/30188	Aggregate Industries UK Ltd	Earlsgate	Falkirk Road	Grangemouth	APC/E/58	an other mineral process

PPC/E/30189	M & D Russell (Haulage) Ltd	Mobile Plant			APC/E/20441	mobile plant
PPC/E/30190	J Fenton & Sons (Contractors) Ltd	Meadowhill OCCS	Forest Mill	Clackmannan	APC/E/20022	coal process
PPC/E/30191	Creagh Concrete (Scotland)	Newbridge Industrial Estate	Newbridge	Edinburgh	APC/E/20456	cement process
PPC/E/30192	Tarmac Northern Ltd	Boards Quarry,	Northfield Road	Denny, FK6 6RA	APC/E/97	Other mineral processes
PPC/E/30193	Edinburgh College of Art	74 Lauriston Place	Edinburgh	EH3 9DF	APC/E/178	glass manufacture and production process
PPC/E/30194	Stewart Pinned Products Ltd	Gairie Works, Kirrie Works	Angus, Scotland	DD8 4BL		Surface Cleaning using Risk Phase solvents
PPC/E/30195	United Demolition Ltd	Mobile Plant				mobile plant
PPC/E/30196	Mr J A Reid of Comrie Garage	Drummond Street	Comrie	PH6 2DW	APC/E/557	combustion (WOB)
PPC/E/30197	Alexander Pollock Ltd	Hospital Road	Haddington	East Lothian	APC/E/10	
PPC/E/30198	G & N Wishart Ltd	Station Road	Friockheim	Angus	APC/E/329	combustion
PPC/E/30199	Skene Group Ltd	Mobile Plant			APC/E/20507 - REVOKED	mobile plant
PPC/E/30200	Broughty Ferry Auto Electrics	17 Panmure Street	Dundee	DD5 2ER	APC/E/369 - REVOKED	road vehicle process
PPC/E/30201	Arnold Clark Automobiles Ltd	5 East Dock Street	Dundee	DD1 3HB	APC/E/372 - REVOKED	road vehicle process
CLAS NUMBERING SYSTEM NOW IN USE						
PPC/B/1000001	Laird Bros (Forfar) Ltd	Whitehill Brickworks	Forfar		APC/E/304	mineral process
PPC/B/1000012	Balfour Beatty Construction (Scotland) Ltd	Mobile Plant			APC/E/213	mobile crushing process
PPC/B/1000011	Donaldson Timber Engineering Ltd	Muiredge Industrial Estate	Buckhaven	Leven	APC/E/488 - REVOKED	Timber process
PPC/B/1000013	Transco plc	Careston	Angus		APC/E/20087	gas odorisation
PPC/B/1000014	Skene Group Ltd	Mobile Plant	Fife		APC/E/20480 - REVOKED	mobile crushing process
PPC/B/1000118	BP Oil UK Limited	Crossroads Service Station	90 Dean Road, Bo'Ness	EH51 0DL	APC/E/	
PPC/B/1000021	Dick Precast Ltd	Taymouth Engineering Works	Anderson Steet	Carnoustie DD7 7LZ	APC/E/20100	cement batching process
PPC/B/1000025	RMC Readymix Ltd	Capo Quarry	Laurencekirk	AB3 1RQ	APC./E/302	cement process
PPC/B/1000036	Elementis UK Limited	Nettlehill Road, Houstoun Industrial Estate	Livingston	EH54 5DC	APC/E/20448	Di-isocyanate process
PPC/B/1000042	Carnoustie Castings Ltd	2a Anderson Street	Carnoustie	DD7 7LZ	APC/E/20081	foundry process
PPC/B/1000045	Eastern Western Motor Group Ltd	454 Gorgie Road,	Edinburgh	EH11 2RN	APC/E/190	Coating process
PPC/B/1000046	D Geddes (Contractors) Ltd	Mobile Plant			APC/E/20043	Mobile plant
PPC/B/1000048	FMC Technologies Ltd	Pitreavie Business Park	Dunfermline	KY11 8UD		Coating process
PPC/B/1000050	Safedem Ltd	Mobile Plant			APC/E/20451 - REVOKED	Mobile Plant
PPC/B/1000063	Charles River Laboratories Preclinical Services Edinburgh Ltd	Elphinstone Research Centre	Tranent	EH33 2NE	APC/E/00001	
PPC/B/1000071	Tarmac Northern Limited	28 Cultins Road, Sighthill Industrial Estate	Edinburgh	EH53 0LG	APC/E/202	
PPC/B/1000073	CEMEX UK Materials Ltd	65 Edinburgh Dock, Leith	Edinburgh	EH6 7DW	APC/E/20009	Coating process
PPC/B/1000080	Grosvenor Grain & Feed Co	Shore Road	Perth	PH2 8BW	APC/E/20483	Fishmeal process
PPC/B/1000082	Babcock Rosyth Defence Ltd	Rosyth Royal Dockyard	Fife		APC/E/20074	Coating process
PPC/B/1000084	T H Fergusson & Co Ltd	Inverkeithing Railway Sidings	Fife		APC/E/20047	Coal Handling Process
PPC/B/1000085	The Scottish Coal Company Ltd	Longannet Colliery			APC/E/425	Coal Handling Process

PPC/B/1000110	Musselburgh Wagon Company Ltd	Inveresk Mills Industrial Park	Musselburgh	East Lothian, EH21 7UQ	APC/E/20003	Coating process
PPC/B/1000114	BP LPG UK	South Shore Road	Grangemouth		APC/E/103	
PPC/B/1000117	Central Demolition Limited	Mobile Plant			APC/E/20470	Mobile Plant
PPC/B/1000118	BP Oil UK Limited	Crossroads Service Station,	90 Dean Road	Bo'ness	APC/E/20378	Petroleum
PPC/B/1000119	Dem-master Demolition Ltd	Ballencrieff Works	Balmuir Road	Bathgate	APC/E/20447	Mobile Plant
PPC/B/1000122	Saint-Goban Building t/a International Timber	Earls Road	Grangemouth	FK£ 8UU	APC/E/20005	Timber process
PPC/B/1000124	Cemex Seament Limited	Imperial Dock North East	Port of Leith	Edinburgh, EH6 7DR	APC/E/184	
PPC/B/1000127	Bredero Shaw Limited	No 1 Plant, Imperial Dock, Leith,	Edinburgh	EH6 7DT	APC/E/20460	Petroleum
PPC/B/1000128	Bredero Shaw Limited	Marine Esplanade	Off Seafield Road	Edinburgh	APC/E/20104	
PPC/B/1000129	Caledonian Offset Ltd	9 Newhaven Road	Edinburgh	EH6 5QA	APC/E/	
PPC/B/1000130	Mitsubishi Electric Air Con Systems Europe Ltd	Nettlehill Road, Houstoun Industrial Estate	Livingston	EH54 5EQ	APC/E/	
PPC/B/1000139	D J Laing (Contracts) Ltd	Mobile Plant			APC/E/20479	mobile plant
PPC/B/1000140	Nationwide Crash Repair Centres Ltd	Liff Road	Dundee	DD2 4UT	APC/E/356	respraying of road vehicles process
PPC/B/1000141	Hanson Quarry Products Europe Ltd	Piper Street	Dundee	DD4 ONT	APC/E/334	cement manufacturing and associated process
PPC/B/1000147	Laird Bros (Forfar) Ltd	Lunanhead	Forfar	Angus DD8 3NQ	APC/E/303	concrete process
PPC/B/1000156	Ennstone Thistle	Clatchard Quarry	Cupar Road	Newburgh, KY14 6JJ		
PPC/B/1000162	Halls Group Ltd	Subsea Protection Systems	Stannergate Road	Dundee, DD1 3NA		cement batching process
PPC/E/1000163	Central Demolition Limited		Stirlingshire	FK4 2AG		mobile crushing process
PPC/B/1000168	Nationwide Crash Repair Centres Ltd	9 Glencryan Road	South Carbrain	Cumbernauld, G67 2UH	APC/E/83	Coating & Printing Process
PPC/B/1000170	Elder & Paton	Arran Road	Perth		APC/E/535 & 550 REVOKED	Coating process
PPC/B/1000110	Musselburgh Wagon Company Ltd	Inveresk Mills Industrial Park	Musselburgh	East Lothian, EH21 7UQ	APC/E/20003	Coating process
PPC/B/1000123	Edinburgh Crematorium Limited	Seafield Cemetery	Seafield Place	Edinburgh, EH6 7QP	APC/E/171	Incineration
PPC/B/1000176	BP Express Shopping Ltd	Bankhead Connect	Woodside Way	Glenrothes, Fife KY7 6GH		Petroleum
PPC/B/1000179	BP Express Shopping Ltd	Harthill South MWSA	M8 Motorway	Harthill, Shotts, ML7 5TT		Petroleum
PPC/B/1000180	BP Express Shopping Ltd	Harthill North MWSA	M8 Motorway	Harthill, Shotts, ML7 5TT		Petroleum
PPC/B/1003134	Perth & Kinross Council	Perth Crematorium	Crieff Road	Perth	APC/E/525	incineration
PPC/B/1003147	Wm Morrison Supermarkets plc	Petrol Station,	Flemington Road	Glenrothes	APC/E/20096	petroleum
PPC/B/1003154	Tarmac Northern Ltd	Tarmac Northern Ltd	Boards Quarry, Northfield, Denny	Falkirk, FK6 6RA		Mobile plant
PPC/B/1003161	Parkgrove Crematorium	Douglasmuir	Friockheim	Angus DD11 4UN	APC/E/307	incineration
PPC/B/1003169	Rigg Service Station	Rigg Service Station	Belhaven Road	Dunbar	APC/E/20464	Petroleum
PPC/B/1003196	McDonald Engineers Ltd				Deemed	
PPC/B/1003200	Wm Morrison Supermarkets plc				Deemed	
PPC/B/1003201	I & H Brown				Deemed	
PPC/B/1003202	I & H Brown				Deemed	

PPC/B/1003205	Tarmac Northern Ltd	Townhill,	Dunfermlie		Deemed	cement
PPC/B/1003206	RMC Readymix Ltd	Cruicks Quarry	Inverkeithing		Deemed	cement
PPC/B/1003215	RJT Excavations Ltd	Mobile Plant			APC/E/20477	Mobile plant
PPC/B/1003217	Kinegar Sand & Gravel	Glenfin Quarry	Cockburnspath	Berwickshire	APC/E/20098	Crushing Process
PPC/B/1003223	Scottish Coal	Port of Leith Coal Loading Operation,	Port of Leith	Edinburgh, EH6 7DX		Coal Handling Process
PPC/B/1003224	RMC Readymix Ltd	Shore Road	Perth	PH2 8NH	APC/E/514	cement & lime manufacturing process
PPC/B/1003225	Brand & Rae Ltd	Russell Mill	Springfield	Cupar KY15 5QX	APC/E/412	coating process
PPC/B/1003226	Nationwide Crash Repair Centres Ltd	Front Lebanon	Cupar	KY15 4EA	APC/E/463	coating process
PPC/B/1003233	Mortonhall Crematorium	Howden Hall Road,	Edinburgh	EH16 6TX	APC/E/163	Incineration
PPC/B/1003236	Brand & Rae Ltd	Dalhousie Sawmill	Dalhousie Estate	Bonnyrigg	APC/E/20466	cement & lime manufacturing process
PPC/B/1003247	Stanley brash Construction Ltd					Mobile plant
PPC/B/1003248	Forth Demolition Ltd					Moblile Plant
PPC/B/1003249	Wm Morrison Supermarkets plc	Almondvale Road	Livingston	EH54 6DB		Petroulem
PPC/B/1003253	Firm of S R Findlay	Glenfin Quarry	Cockburnspath	Berwickshire	APC/E/20098	Crushing Process
PPC/B/1003257	MI Great Britain Ltd	Foss Mine	Aberfeldy		APC/E/518	Mineral process
PPC/B/1003258	Lix Toll Garage Ltd	Lix Toll	Killin		APC/E/20503	petroleum process
PPC/B/1003259	R Crighton	Blair Atholl Garage	Pitlochry		APC/E/20502	petroleum process
PPC/B/1004240	Black & Veatch Ltd	Bathgate to Newarthill 1200mm odorisation facility				Refining Mineral Oil and Gas, Operating Coke Ovens and Coal Gasification and Liquefaction Activities
PPC/B/1004248	Aggregate Industries UK Ltd	Cambusbeg Quarry	By Callander		APC/E/559	cement process
PPC/B/1004249	Sterling Precast Limited	Springkerse Works	Whitehouse Road	Stirling	APC/E/563	bulk cement process
PPC/B/1004250	Mr W Cram				APC/E/576	vehicle re-spraying process
PPC/B/1004270	T Carstairs & Co	Pitkerie Garage	Anstruther	Fife	APC/E/20510	petroleum process
PPC/B/10004272	United Glass Limited	Sand Developments	Devilla Forest Quarry	Bogside Station, By Alloa	APC/E./422	mineral drying process
PPC/B/10004273	Hanson Quarry Products Europe Ltd	Fordell	Crossgates	Cowdenbeath	APC/E/405	Cement Process
PPC/B/1004274	Birnam Autopoint	Birnam Autopoint	Birnam	Dunkeld	APC/E/20506	Petroleum Process
PPC/B/1004285	Shell UK Retail	Shell Kirkcaldy	Hendry Road	Kirkcaldy	APC/E/20276	petroleum process
PPC/B/1004289	Thomas Muir (Haulage) Ltd	Mobile Plant			APC/E/20025	Mobile plant
PPC/B/1004290	Realm Construction Ltd	Mobile Plant			APC/E/20099	Mobile plant
PPC/B/1004296	Barhaul Ltd	Dunkeld Road	Aberfeldy		APC/E/519	crushing of barytes ore
PPC/B/1004297	Hanson Quarry Products Europe Ltd	Friarton Road	Perth	PH2 8DE	APC/E/516	cement process
PPC/B/1004298	Tarmac Northern Ltd	Friarton Quarry	Gleneagles Road	Perth	APC/E/517	quarry process
PPC/B/1004313	J & A Laird Ltd	Marlee Quarry	by Blairgowrie	Perth		quarry process
PPC/B/1004314	Mr James Conlan	Beath Service Station	Cowdenbeath		APC/E/202220	petroleum process
PPC/B/1004316	Forth Demolition Ltd	N/A Mobile Plant				Mineral process
PPC/B/1004324	CRM Recycling Ltd	Mobile Plant				Mobile plant
PPC/B/1004336	Peter Hastie Motors	James Street	Pittenweem	Anstruther	APC/E/20210	petroleum process
PPC/B/1004340	Osprey Forecourts Ltd	Meadow Filling Station	Crosshill	Fife	APC/E/20133	petroleum process
PPC/B/1004341	Osprey Forecourts Ltd	Glen Filling Station	Kelty	Fife	APC/E/20132	petroleum process
PPC/B/1004342	Gleaner Oils Ltd	Broad Street	Cowdenbeath	Fife	APC/E/20142	petroleum process
PPC/B/1004343	Tayside Contracts	Collace Quarry	Perthshire		APC/E/521	quarry process
PPC/B/1004400	Tay Racers	Balbeggie Service Station	Main Street	Balbeggie	APC/E/20520	petroleum process
PPC/B/1004402	Speciality Glass Design Ltd	Croft Road	Hawick	TD9 9RD		glass manufacturing process
PPC/B/1004466	Masterton Demolition	Mobile Plant			-	Mobile Plant
PPC/B/1004467	Clive Bridges	Ballinluig Services	Ballinluig	PH9 0LG	APC/E/20190	petroleum process

SEPA Part A PPC Application Database

PPC NUMBER	APPLICANT	LOCATION ADDRESS 1	LOCATION ADDRESS 2	LOCATION ADDRESS 3	RELEVANT LICENCES	DESCRIPTION OF ACTIVITY
PPC/E/20001	Levenseat Limited	Levenseat Quarry	West Lothian	EH47 9AD	WML/E/20189 WPC/E/20942	Landfill Recovery
PPC/E/20002	Avanex Uk Ltd	Starlaw Industrial Park	Starlaw Road	Livingston EH54 8SF		Manufacture acitivity involving inorganic chemicals
PPC/E/20003	Caledonian Env Ser PLc	Methilhaven Road	Methil	Leven KY8 3LA	IPC/E/20027 & WPC/E/20719	
PPC/E/20004	Borders General Hospital NHS Trust	Borders General Hospital	Melrose	TD6 9BS	APC/E/24 WML/E/137 RSA/E/258 34/00/AS	Incineration
PPC/E/20005	Foseco Steel UK Ltd	Hillview Road	Bonnybridge	FK4 2EH	APC/E/33	
PPC/E/20006	Glenrath Farms Limited	Tile Works	Easter Deans, Leadburn	Peebles EH46 9BG	COPA Application in process	
PPC/E/20007	Waste Recycling Group (Scotland) Ltd	Drummond Moor (no2) Landfill and Waste Management Complex	Drummond Moor,	Penicuick	WML/E/20192 & WML/E/20194	
PPC/E/20008	Inveresk plc	Westfield Mill	Westfield	Bathgate	WPC/E/20495 WPC/E/6507 WPC/E/3313 & IPC Exception	
PPC/E/20009	Kilbagie Recycled Fibres Ltd	Kilbagie Mill	Alloa	Clackmannanshire FK10 4AF	IPC/E/20001	
PPC/E/20010	Curtis Fine Papers	Dalmore Mill	Milton Bridge	Midlothian	WPC/E/328	Paper manufacture
PPC/E/20011	Smith Anderson & Co Ltd	Fettykill Mills	Leslie	Fife, KY6 3AQ	IPC/E/20010 & APC/E/388	Paper manufacture
PPC/E/20012	Ahlstrom Chirnside Ltd	Ahlstrom Chirnside Ltd	Chirnside	Duns, TD11 3JW	WPC/E/7328 & IPC/E/21	Paper manufacture
PPC/E/20013	Tullis Russell Papermakers Ltd	Markinch	Glenrothes	Fife, KY7 6PB	IPC/E/20009 & IPC/E/60	Paper manufacture
PPC/E/20014	Curtis Fine Papers Ltd	Guardbridge Mill	St Andrews	Fife, KY16 OUU	CP1312 & APC/E/390	Paper and board
PPC/E/20015	Sappi (UK) Ltd	Transcript Mill	Markinch	Fife, KY7 6QP		
PPC/E/20016	Klippan International plc	Caldwells Mill	Inverkeithing	Fife, KY11 1DN	IPC/E/20006 & IPC/005/1993	Paper manufacture
PPC/E/20017	Smith Anderson Packaging Ltd	Fettykill Mills	Leslie	Fife, KY3 3AQ	APC/E/20026	
PPC/E/20018	Inveresk plc	Carrongrove Paperboard Mill	Denny	Stirlingshire, FK6 5HJ	IPJ/1/CB/8 003/1993 COPA-R3720-N382 WPC/E/3718 WPC/E/7174	Paperboard Manufacture
PPC/E/20019	Forth Estuary Engineering	Edinburgh Dock	Edinburgh	EH6 7DW	APC/E/20064	Coating Activities
PPC/E/20020	Lafarge Cement UK Ltd a division of Blue Circle Industries plc	Lafarge Cement UK Ltd	Dunbar Works,	Dunbar, EH42 1SL	WML/E/73 & IPC/E/16	Cement & Lime Process
PPC/E/20021	Superglass Insulation Ltd	Thistle Industrial Estate	Kerse Road	FK7 7RW	IPC/E/62	Manufacture of Glassfibre

PPC/E/20022	Intercell Biomedical Ltd	Oakbank Park Road	Livingston	EH53 0TG		Pharmaceutical Production
PPC/E/20023	DANA Glacier Vandervell	4 Inchmuir Road	Whitehill Industrial Estate	Bathgate, EH48 2EW		Production & Processing of Non-Ferrous Metals
PPC/E/20024	DKL Metals Ltd	Avontoun Works	Linlithgow	EH49 6QD	IPC/080/1996	Production & Processing of Non-Ferrous Metals
PPC/E/20025	BAE Systems Avionics Ltd	BAE Systems	18 Muirhouse Bank	Edinburgh, EH4 4AD		
PPC/E/20026	Crown UCP Limited	1 Steuart Road,	Bridge of Allan	Stirling FK9 4JG	APC/E/564	
PPC/E/20027	Feralco UK	North Shore Road	Carron Dock	Grangemouth, FK3 8UB		Inorganic Chemicals
PPC/E/20028	Isola Werke UK Ltd	2 Wyndford Road	Wardpark Industrial Area	Cumbernauld, G68 0BA	CUK/008	Resin manufacture, storage of manufactured resin and raw materials, production of laminate products and thermal incineration of solvent off-gas
PPC/E/20029	API Folis Limited	Firth Road	Houstoun Industrial Estate	Livingston EH54 5DJ	EPA/22/93	
PPC/E/20030	Amcor Flexibles UK Limited	Intaglio House	Brucefield Business Park	Livingston, EH54 9ES	EPA/26/94	Coating Activities, printing & textile treatment.
PPC/E/20031	Halley Stevensons (Dyers & Finishers) Ltd	Baltic Works	Annfield Road	Dundee, DD1 5JH		coating, printing and treatment of textiles
PPC/E/20032	Danapak Flexibles Ltd	Kemback Street	Dundee	DD4 6ET	EPA/4/93	
PPC/E/20033	J T Inglis & Sons Ltd	Riverside Works	Stannergate	Dundee, DD1 3LU		
PPC/E/20034	Interflek Scotland Limited	Interflek Scotland Limited	Peggy's Mill, Mayfield Industrial Estate	Mayfield, Dalkeith, EH22 4AE		Coating Activities, printing & textile treatment.
PPC/E/20035	Michelin Tyre PLC	Baldovie Road	Dundee	DD4 8UQ	IPC/050/1993 & EPA/6/1993	
PPC/E/20036	Silberline Ltd	Banbeath Raod	Leven	KY8 5HD	EPA/A/B4/48/93	
PPC/E/20037	Forbo-Nairn Ltd	PO Box 1 Den Road	Kirkcaldy	KY1 2SB	EPA/A/B4/50/93	The manufacture of cushion vinyl flooring
PPC/E/20038	Flexcon Glenrothes Ltd	Whitworth Road	Glenrothes	KY6 2TF	APC/E/20030	Surface treating surfaces, objects or products with adhesive using organic solvents, with a consumption capacity of more than 200 tonnes/year
PPC/E/20039	D C Thomson & Co Ltd	80 Kingsway East	Dundee	DD4 8SL	EPA/8/93	A gravure printing process
PPC/E/20040	St Andrews Chemtech Int Ltd	Prestonhall Indus Estate	Cupar, Fife	KY15 4RD	IPC/E/20017	organic chemicals
PPC/E/20041	Benkert UK Ltd	Alva	Clackmannanshire	FK12 5DW	CDC/14/53/6/93	the rotogravure printing of cigarette tipping paper and other printed paper products
PPC/E/20042	Semefab (Scotland) Ltd	Newark Road South	Eastfield, Glenrothes	KY7 4NS	None	the manufacture of microelectronic integrated circuits and microelectronic-mechanical systems
PPC/E/20043	Diosynth Limited	Muiredge Ind Estate	Buckhaven, Fife	KY8 1LJ	IPC/013/1994 (IPC/E/55)	Organic Chemicals
PPC/E/20044	Sacone Environmental Ltd	Montrose Road	Brechin	Angus DD9 7PL	IPC/E/20022	Incineration
PPC/E/20045	Transco	Gowanbank	Avonbridge	West Lothian FK1 2JY	IPC/E/14	Combustion Activities
PPC/E/20046	BAE Systems Avionics Ltd	Crewe Toll House	Ferry Road	Edinburgh		
PPC/E/20047	D A Kennedy (Construction) Ltd	Balmanno Estate	Aberargie	Perth		Landfill Site

PPC/E/20048	United Glass Ltd	Glasshouse Loan, Alloa	Clackmannanshire	FK10 1PD	APC/E/568	
PPC/E/20049	William Bell Grieve	Mains of Taymouth	Kenmore	PH15 2HN		Landfill Site
PPC/E/20050	Day International (UK) Ltd	Balgray Street	Dundee	DD3 8HN	APC/E/361	
PPC/E/20051	Borden Chemicals UK Ltd	c/o Nexfor Site	Station Road,	Cowie, Stirling, FK7 7BQ	IPC/010/1994 (IPC/E/15)	
PPC/E/20052	Dorenal Ltd	Kilminning Workshops,	Old Airfield	Crail, Fife KY10 3XN	IPC/057/1994 (IPC/E/56)	
PPC/E/20053	George Adam & Partner	Cowie Road	Bannockburn			Landfill/TStn/TP
PPC/E/20054	Norbord Limited	Station Road	Cowie	Stirling, FK7 7BQ	APC/E/574	
PPC/E/20055	Dalkia Utilities Services plc	Ahlstrom Chirnside Ltd	Chirnside	Duns, TD11 3JW	PART of PPC/E/20012	Boiler Plant
PPC/E/20056	SITA	Binn Farm Landfill Site	Binn Farm	Perthshire, PH2 9PX	WML/E/298	Landfill
PPC/E/20057	Waste Recycling Group (Scotland) Ltd	Oatslie Sandpit Landfill Site	Cleugh Road, Roslin	Midlothian, EH25 9QN	WDC/WDL/33/94 WML/E/97	Landfill Activities
PPC/E/20058	Viridor Waste Mangement Ltd	Dunbar Landfill	Oxwell Mains, Dundar	East Lothian, EH42 1SW	WML/ELN/26	Landfill Activities
PPC/E/20059	Avondale Environmental Limited	Avondale Landfill	Avondale Quarry, Polmont,	Falkirk, FK2 0YG	WML/E/20170 WPC/E/22465 WPC/E/21154 WPC/E/22661	Landfill Activities
PPC/E/20060	I & H Brown Ltd	Battleby Landfill Site	Battleby	Redgorton	WML/E/20131	Landfill
PPC/E/20061	Errol Brick Company Ltd	Inchoonans Road	Errol	Perth	APC/E/513	Ceramics
PPC/E/20062	Caradale Brick Company	Etna Works	Lower Bathville Road	Armadale, West Lothian, EH48 2LZ	APC/E/34	Ceramics
PPC/E/20063	Avecia Limited	Earls Road	Grangemouth	FK3 8XG	IPC/046/1994	Disposal Activities (Other than incineration or landfill)
PPC/E/20064	Bekaert Handling Limited	Queensway Industrial Estate	Glenrothes	Fife , KY7 5QJ		Alkaline zinc electroplating
PPC/E/20065	Grampian Country Food Group Ltd	Grampian Country Food Group	George Street	Coupar Angus		
PPC/E/20066	DARA (Defence Aviation Repair Agency)	Almondbank	Perth	PH1 3NQ	IPC/E/20013	Surface treatment of metals and use of cadmium
PPC/E/20067	Anglo Beef Processors Ltd	Ruthvenfield Road	Inveralmond	Perth PH1 3XB	N/A	
PPC/E/20068	Joseph Mitchell (Letham) Ltd	2 Woodside Road	Letham, Forfar	Angus DD8 2QD	N/A	Chicken Slaughtering
PPC/E/20069	ABP Ltd	Bathgate				Beef Processing
PPC/E/20070	Wyman Gordon Ltd	Houston Road	Livingston	West Lothian, EH54 5BZ	Trade Effluent Discharge Consents 48/00/D 04/03/C	Surface Treatment
PPC/E/20071	Flexible Surface Technology	2-3 Muir Road	Houston Industrial Estate	Livingston, EH54 5DR	SWC 14/01/C	Surface Treatment
PPC/E/20072	Dowding & Mills Engineering Services	Lochlands Industrial Estate	Larbert	Stirlingshire FK5 3NS		
PPC/E/20073	Macarron Electroplaters Ltd	Unit 1 Newford Park	Orchardpark Industrial Estate	Forfar, DD8 1UQ		
PPC/E/20074	Buko Ltd	Ashley Road	Southfield Ind Estate	Glenrothes		Zinc Plating
PPC/E/20075	Forfar Galvanisers Ltd	Carseview Road	Forfar	Angus DD8 3BT	PPC/E/30101	surface treating of metals
PPC/E/20076	ABP Ltd	Whitburn Road	Bathgate	EH48 2HR		Beef Processing
PPC/E/20077	Grampian Country Pork Halls Ltd	East Main Street	Broxburn	West Lothian, EH52 5AW		Slaughtering Animals
PPC/E/20078	A P Jess (Brechin) Ltd	Montrose Road	Brechin	Angus, DD9 7PL		Slaughtering of Cattle
PPC/E/20079	Scotbeef Ltd	Longleys	Bridge of Allan	Stirling FK9 4NE		Slaughter of Animals

PPC/E/20080	Biomar Limited	North Shore Road	Grangemouth	FK3 8UL		
PPC/E/20081	Matheson Jess Ltd	99 Broughty Ferry Road	Dundee	DD4 6JE		Slaughter of Animals
PPC/E/20082	Deans Foods Ltd	Edgefield Road Industrial Estate	Loanhead, Edinburgh	EH20 9TB		
PPC/E/20083	Fife Council	Lochhead Landfill, Drumtuthill Road,	Wellwood, Dunfermline	Fife	WML/E/20087	Landfill
PPC/E/20084	EWOS Ltd	Westfield	Bathgate, West Lothian	EH48 3BP	APC/E/94	
PPC/E/20085	Fife Council	Lower Melville Wood	By Ladybank	Cupar	WML/E/20063	landfill
PPC/E/20086	Shanks Avondale Limited	Avondale Hazardous Landfill Site	Avondale Quarry, Polmont,	Falkirk FK2 0YG		landfill
CLAS NUMBERING SYSTEM NOW IN PLACE						
PPC/A/1000040	Raytheon Systems Ltd	Queensway Industrial Estate	Glenrothes	Fife, KY7 5PY	IPC/E/61	
PPC/A/1000047	Shin-Etsu Handotai Europe Ltd	Wilson Road, Toll Roundabout	Eliburn	Livingston, EH54 7DA	IPC/E/20019	inorganic chemicals
PPC/A/1000059	Rockwell Solutions Ltd	Brunel Road, Wester Gourdie Industrial Estate	Dundee	DD2 4TG		
PPC/A/1000061	Lexmark International Ltd	Admiralty Park	Rosyth	Dunfermline, ky11 2yw		
PPC/A/1000078	Metron Technology Ltd	80 Whitecraigs Road	Whitehill Industrial Estate	Glenrothes, KY6 2RX		
PPC/A/1000095	Compugraphics International Ltd	Eastfield Industrial Estate	Glenrothes	Fife KY7 4NT		
PPC/A/1000099	Serinco Metalfinishers Ltd	73 Whitecraigs Road	Whitehills Ind Estate	Glenrothes, Fife KY6 2RX		
PPC/A/1000112	Scottish Borders Council	Easter Langlee Landfill Site	Langshaw Road	Galashiels, TD1 2NT	WML/E/20099	Landfill Activities
PPC/A/1000120	Angus Council	Restenneth Landfill Site	Montrose Road	Forfar, DD8 2RL	WML/E/20140	
PPC/A/1000157	Diageo Distilling Ltd	Cameronbridge Distillery	Leven	Fife		
PPC/A/1000172	The North British Distillery Company Ltd	9 Wheatfield Road	Edinburgh	EH11 2PX		
PPC/A/1003150	Robert Hutchison Ltd	Mills at East Bridge	East Bridge	Kirkcaldy		
PPC/A/1003151	ADM Milling Ltd	Chancelot Mill	Edinburgh			
PPC/A/1003156	Joseph Mitchell (Letham) Ltd	2 Woodside Road	Letham, Angus		PPC/E/20068	
PPC/A/1003157	Dundee Energy Recycling Ltd	Forties Road	Dundee	DD4 ONS	IPC/E/20018	
PPC/A/1003159	Charles River Laboratories Preclinical Services Edinburgh Ltd	Inveresk - Incinerator	Elphinstone Research Centre	Tranent, Edinburgh, EH33 2NE		Incineration
PPC/A/1003160	Shanks Waste Management Ltd	West Shore Road	Granton	Edinburgh, EH5 1QD		Recovery, combustion & incineration
PPC/A/1003165	Marshalls Food Group Ltd	Fairview Mill	Ingliston	Midlothian, EH28 8NB		The treatment of animal and vegetable matter and food industries
PPC/A/1003168	ABNA Ltd	Damside Mill	Cuparmuir	Cupar		
PPC/A/1003204	Wyman-Gordon Limited	Houstoun Road	Livingston	EH54 5BZ		
PPC/A/1003207	J Haig Hamilton & Sons	West Fortune Landfill	West Fortune	Drem, North Berwick, EH39 5LL		
PPC/A/1003221	Carbon Filter Technology Ltd (awaiting confirmation from MH re applicant's details)					
PPC/A/1004245	KemFine UK Ltd	Bo'ness Road	Grangemouth	FK3 8XG		Disposal of Waste - other than incineration or landfill
PPC/A/1004252	Scottish Water	Broadside Landfill	Carron Valley Treatment Works	Denny, Falkirk, FK6 5JE		Landfill
PPC/A/1004254	Scottish Power Generation Limited	Cockenzie Ash Lagoons, Near Musselburgh	East Lothian	Scotland		Landfill
PPC/A/1004265	Scottish Power Generation Limited	Longannet Power Station				
PPC/A/1004266	Scottish Power Generation Limited	Valleyfield Ash Lagoons				

PPC/A/1004267	Angus Horticulture Ltd			
PPC/A/1004282	Marshall Farms Ltd	Muirpark Landfill	Tullibody	
PPC/A/1004300	G R Service Company	West Carron Landfill Site,	Carron Works, Stenhouse Road	Falkirk, FK2 8DR

Appendix 4
SCREENING TOOLS USED IN THIS ASSESSMENT

CONTENTS

Design Manual for Roads and Bridges (DMRB) - This screening method was formulated by the former Department of Transport. The method gives a preliminary indication of air quality near roads. The DMRB method requires information on vehicle flow, HDV mix, vehicle speed and receptor-road distances. It contains a useful database of vehicular emission factors for future years.

The method adopts the annual mean concentration as the base statistic. Background pollutant levels are included explicitly in the calculations by adding an amount to the annual mean traffic contribution using the Air Quality Archive or default values The model also estimates, from the annual mean PM_{10} prediction, the number of days where the PM_{10} concentration exceeds the 50µg m^{-3} daily mean objective. The latest version of the DMRB spreadsheet has been used for this assessment.

Appendix 5
TRANSPORT PROPOSALS IN THE FIFE STRUCTURE PLAN

CONTENTS

PROPOSAL PT1: Transport Proposals

Transport Proposals are listed below according to whether they improve Fife's accessibility within the National/International Network or whether they relate primarily regional or to internal Fife movements. However, because transport operates at a network level, local proposals enhance access to the national network where effective integration is achieved.

National/International

- new multi-modal cross-Forth bridge and associated approach networks at Queensferry – initial feasibility study with potential for a new bridge within the Plan period
- segregated public transport corridor through the Forth Bridgehead Area, including the existing Dunfermline Eastern Expansion area, with potential to link to a further Forth crossing
- passenger rail on Dunfermline-Kincardine-Alloa-Stirling line

City Region

- port and other related infrastructure for a cross-Forth ferry at Kirkcaldy or Burntisland
- southbound High Occupancy Vehicle (HOV) lane, M90/A90, Halbeath to Forth Road Bridge
- proposals which enhance accessibility along key corridors will be further considered including to the West and from rural East Fife through to Perth, and from Mid Fife to Dundee, including improvements to the A92
- park and ride and/or choose facilities/interchange at St Andrews, Tay Bridgehead, Rosyth, Halbeath, Markinch, Ferrytoll extension, Dalgety Bay extension and Inverkeithing

Fife Regional

- improvements to Redhouse A92(T) to Gallatown corridor including Standing Stane Road link to Redhouse
- improvements to Bankhead Roundabout
- new rail stations at Newburgh, Kirkcaldy East, Dunfermline South , Burntisland (or refurbished), and Wormit
- Rosyth Bypass
- Chapel Junction upgrade A92(T)
- Levenmouth passenger rail line reopening and land for new stations
- transport improvements identified in relation to the development of the Strategic Development Areas
- Dunfermline Rail Chord (all ways junction)
- further consideration of transport link options for St Andrews to the rail network will be addressed through the review of the Local Transport Strategy
- Cupar relief road