City of NOTTINGHAM

Air Quality Review & Assessment







First Stage & Second Stage APRIL 2000



City of Nottingham

Air Quality Review and Assessment: First Stage and Second Stage

April 2000

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Director of Environmental Services

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Glossary

AQ	Air Quality
AQMS	Air Quality Mobile Station
ARIC	Atmospheric Research and Information Centre
AURN	Automatic Urban and Rural Network
CERC	Cambridge Environmental Research Consultants Ltd
CO	Carbon Monoxide
DETR	Department of the Environment, Transport and the Regions
EPAQS	Expert Panel on Air Quality Standards
Exceedance	A period of time where the concentration of a pollutant is greater than, or equal to, the appropriate air quality standard
LSO	Local Site Operator
MW	Megawatt -1 million watts
NAQS	National Air Quality Strategy
NEI	National Emissions Inventory
NETCEN	National Environmental Technology Centre
ngs	Nanogrammes - one thousand millionth of a gramme
NO_2	Nitrogen dioxide
NOx	Nitrogen oxides
Percentile	A value that is the rank at a particular point in a collection of data. For instance, a 98th percentile of values for a year is the value that 98% of all the data in the year fall below, or equal.
PM10	Particulate matter 10 microns(millionths of a metre) or less in diameter
ppb / ppm	parts per billion / million - the concentration of a pollutant in air in terms of volume ratio
Running mean	The mean or series of means calculated for overlapping time periods . For instance , an 8 hour running mean is calculated every hour and averages the values for the previous eight hours. There are therefore 24 possible 8-hour means in a day (calculated from hourly data)
SO_2	Sulphur dioxide
ugs	microgrammes - one millionth of a gramme
ugs m^{-3}	microgrammes per cubic metre. A measure of concentration in terms of mass per unit volume
VOC	Volatile organic compounds e.g. benzene

Executive Summary – Air Quality Review and Assessment
First Stage and Second Stage – March 2000

The Government announced its Air Quality Strategy on the 12th March 1997 giving local authorities until the 31st December 1999 to carry out a progressively intensive three stage review and assessment of air quality.

Review and assessment has to be implemented in accordance with Government guidance comparing local air quality with objectives specified in the Air Quality Regulations 1997, which have to be achieved by the Year 2005 for the pollutants of concern which are:-

Benzene	**1, 3 Butadiene**
Carbon monoxide	**Lead**
Nitrogen dioxide	**Particulates (PM_{10})**
Sulphur dioxide	**Ozone**

All local authorities are expected by the Government to carry out a First Stage review and assessment to identify all potential sources of pollution including:-

- industrial processes likely to emit substantial quantities of pollutants of concern;
- other significant pollutant sources;
- roads which exceed prescribed levels of use or congestion.

A Second Stage review and assessment is to be carried out in areas at risk of elevated pollutant levels at roadside, industrial and urban background locations. Only if there is a significant risk of an air quality objective being breached need the local authority go on to the next stage.

A Third Stage review and assessment is a more detailed assessment of the pollutants of concern involving monitoring and modelling of pollutant levels to predict whether air quality objectives will be met by the Year 2005.

Because pollution knows no boundaries, Nottingham City Council has been working in partnership with all other district councils within the County and with Nottinghamshire County Council who collectively engaged consultants to carry out a preliminary review of air quality within the County for them.

Nottingham City Council's Fist Stage and Second Stage reviews and assessments are specified within the Report – March 2000 – the results of which are:-

Benzene : A large petroleum depot approximately 2 km from the City's eastern boundary required that a Stage 2 review and assessment for benzene was implemented. The Stage 2 review and assessment identified that no significant increase in benzene was likely, the air quality objective was unlikely to be breached either now or in the future and that a Stage 3 review and assessment of benzene was therefore not necessary.

1, 3 Butadiene : It was apparent from the Stage 1 review and assessment that levels of this pollutant were unlikely to approach its air quality objective. Progression to Stage 2 was therefore unnecessary.

Carbon Monoxide : Emissions from roads which exceed the annual average volume and flow criteria indicated the necessity of carrying out a Stage 2 review and assessment for carbon monoxide. Available monitoring data and predictions of traffic volumes demonstrate that as a result of the Stage 2 review and assessment, it is not necessary to proceed to Stage 3.

Sulphur Dioxide : Part A industrial processes and combustion processes within and outside the City, and potential effect from domestic coal burning in neighbouring areas are significant grounds to necessitate a Second Stage review and assessment for sulphur dioxide. Results from this review and assessment indicate that no significant increases in sulphur dioxide are likely but the air quality objective, in the vicinity of a large coal fired boiler will not be met by the Year 2005. It is therefore necessary to proceed to Third Stage review and assessment.

Lead : The Stage 1 review and assessment identified that there are no significant sources of lead in the City other than emissions from road traffic and from which emission levels have declined substantially since the progressive introduction of unleaded petrol. Environmental conditions will improve still further as leaded petrol was been withdrawn from sale. It is not, therefore, intended to carry out a Second Stage or Third Stage review and assessment for lead.

Ozone : This is a secondary pollutant formed by chemical reactions of primary pollutants in the presence of sunlight – usually some distance from their source from which it is derived. Monitored levels exceed the air quality objective at national monitoring stations throughout the country. The Government has decided that there is little effective action that local authorities can take to reduce this pollutant and that national policies and international action must be relied on to achieve the necessary reduction in ambient levels.

Nitrogen Dioxide and Particulates (PM_{10}) : Industrial processes, major roads and monitoring data demonstrate sufficient concern about these pollutants to implement the more detailed Third Stage review and assessment for both nitrogen dioxide and particulates (PM_{10}) as it is considered that a Second Stage review and assessment will not add to the information already held about these pollutants.

Air Quality Regulations 1997	AUN (1998)	AQMS (1998-99)
NO_2 Objectives 150 ppb as a 1 hour mean 21 ppb as an annual mean	98 ppb (maximum 1 hour mean) 25 ppb (annual mean)	95 ppb (maximum 1 hour mean) 21 ppb (annual mean)
SO_2 Objective 100 ppb as a 15 minute mean 99.9th percentile (35 exceedances per year)	6 ppb (annual mean) 23 exceedances over 3 days	3 ppb (annual mean) 25 exceedances over 4 days
CO Objective 10 ppm as a running 8 hour mean	0.6 ppm (annual mean) 7.1 ppm (running 8 hour maximum)	0.2 ppm (annual mean) -
(Particles) PM_{10} Objective 50 ug m^{-3} as a running 24 hour mean 99th percentile (4 exceedances allowed per year)	21 ug m^{-3} (annual mean) 89 ug m^{-3} (maximum running 24 hour mean) 175 exceedances over 12 days	18 ug m^{-3} (annual mean) - -

The Air Quality Regulations were revised and published for consultation in November 1999; it is proposed that they be enacted during 2000. The overlapping of the revised Air Quality Regulations, revised guidance and Nottingham City Council's own First Stage and Second Stage review and assessment is unfortunate, as confusion as to which standards are appropriate can arise. However, where a local authority has completed a First Stage and Second Stage review and assessment it is not required to undertake a re-assessment. The Third Stage review and assessment for particles PM10, nitrogen dioxide NO2 and sulphur dioxide will use the latest Air Quality Regulations.

The Third Stage review and assessment of nitrogen dioxide and particulates (PM_{10}) and sulphur dioxide will be carried out by the 30th June 2000, following which results will be published and further consultation about the findings will be carried out.

Where an air quality objective is unlikely to be met by the Year 2005, the local authority must declare an Air Quality Management Area and devise an action plan to address the problem associated with the pollutant of concern.

Consultation about the First Stage and Second Stage review and assessment was carried out and the consultees included:-

- The Secretary of State;
- The Highways Authority;
- all neighbouring local authorities;
- Nottinghamshire County Council;
- other relevant public bodies;
- local business representative bodies;
- other bodies as considered appropriate;
- Community groups;
- Environmental groups;
- Local Government Office.

The UK National Air Quality Strategy will have significant implications for future planning and transportation issues. It is a major factor influencing the well being and quality of life for the whole population. This initial work and the results of consultation will provide the basis for the assessment of the benefits and viability of future initiatives to improve our environment.

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1 Introduction

1.1 Society's concern about the quality of the air we breathe resulted in the enactment of The Environment Act 1995 - Part IV of which introduced the concept of Local Air Quality Management.
Under Section 82 of this Act local authorities are required to review the air quality in their area and assess whether the Air Quality Standards and Objectives will be achieved by the prescribed date for each pollutant of concern.

1.2 The review and assessment process has three stages, each with increasing depth of investigation, designed to ensure only those pollutants which will or are likely to exceed the air quality objectives are assessed in the next stage. The reasons for proceeding to each subsequent stage of the review and assessment must be clearly demonstrated, supported and in accordance with Government guidance.

1.3 The Act led to the publication of The National Air Quality Strategy (NAQS) in 1997 which proposed a number of air quality standards and objectives, for seven substances, to be achieved by the year 2005.

1.4 The Air Quality Regulations 1997 formalised the air quality objectives, which have to be met by 2005. These were recently subject to review and the proposed revised objectives are detailed in Table 1a. For the purpose of the Stage 1 and 2 review and assessment the objectives specified in the 1997 Regulations are used.

1.5 Where air quality standards are not being met Section 83 of the Environment Act 1995 requires a local authority to designate that area, by Order, an Air Quality Management Area (AQMS).

2. Purpose and focus

2.1 The purpose of this report is to detail the First Stage and Second Stage review and assessment process undertaken by the City of Nottingham (hereinafter termed Nottingham City Council or the Local Authority) and to identify the need for Air Quality Management Areas.

2.2 The review and assessment process has been undertaken in accordance with LAQM. TG4 (98) 'Review and Assessment: pollutant specific guidance' published by the Department of the Environment Transport and the Regions (DETR) para 1.14:

For objectives with short averaging times (i.e. 15 minutes objective for sulphur dioxide (SO_2), and the hourly objective for nitrogen dioxide (NO_2) reviews and assessments will be focused on any non-occupational, near ground level outdoor location given that exposures over such short averaging times are potentially likely;

- For objectives with longer averaging times (annual mean for benzene, 1,3 butadiene, lead and nitrogen dioxide, 24 hour running mean for PM10, and 8 hour running mean for carbon monoxide), reviews and assessments are focused on the following near ground level outdoor locations
- background locations
- roadside locations and
- other areas of elevated pollutant concentrations where a person might reasonably be expected to be exposed (e.g. in the vicinity of housing, schools or hospitals etc) over the relevant averaging time of the objective.

2.3 The objectives are specified in the Air Quality Regulations 1997 and reproduced in Table 1.

The draft revised guidance framework for review and assessment of air quality published on the 5th November 1999 proposes amendments to the Air Quality Regulations 1997 and are reproduced in Table 1a.

The draft revised guidance also goes onto state that '....Those authorities which have completed part of their review and assessment (eg First Stage and Second Stage, but not Third Stage) before the

introduction of the new regulations will not need to redo the stages already carried out, but should shift the remaining parts of their review and assessment with immediate effect to the new objectives.'

In view of this draft guidance Nottingham City Council has amended its First Stage and Second Stage review and assessment purely on responses to its consultation process, and proposes to conduct the Third Stage review and assessment in accordance with the Air Quality Regulations 2000, when published.

Table 1

Air Quality Objectives to be achieved by 2005

Substance	Air Quality Objective [1]
Benzene	5 ppb[2] or less when expressed as a running annual mean
1,3 Butadiene	1 ppb or less when expressed as a running annual mean
Carbon Monoxide	10 ppm[3] or less when expressed as a running 8 hour mean
Lead	0.5 ugm^{-3} or less when expressed as an annual mean
Nitrogen Dioxide	150 ppb or less when expressed as an hourly mean and 21 ppb or less when expressed as an annual mean
PM10[4]	50 ugm^{-3} or less when expressed as the 99th percentile[5] of daily maximum running 24 hour mean
Sulphur Dioxide	100 ppb or less when expressed as the 99.9th percentile[6] of 15 minute means

Notes:

1. To be achieved by the 31st December 2005,
2. ppb means parts per billion (parts per 1000 million by volume),
3. ppm means parts per million,
4. PM10 means the mass fraction of particles which if inhaled would penetrate beyond the larynx, which comprises particulate matter with an aerodynamic diameter of 10 microns ($10x10^{-6}$ metres) or less.
5. Objectives to be achieved on all but 4 days per year.
6. Objectives to be achieved on all but 35 periods of 15 minutes per year (assuming complete data capture)

Ozone

Ozone is a secondary pollutant formed by the complex inter-reaction of nitrogen dioxide (NO_2), nitrogen oxide (NO), hydrocarbons (VOC's) and sunlight. The chemistry involved results in its ready formation and persistence in rural areas. Thus while local authorities are able to make a significant impact on the reduction of ozone precursors at a local level, their action is unlikely to reduce ozone levels in the same locality. The responsibility for achieving the ozone objective therefore lies at national and international levels hence its omission from the above objectives.

Table 1a

Proposed Air Quality Objectives

Pollutant	Objective	measured as	Date to be achieved
Benzene	16.25 ugm^{-3} (5 ppb)	running annual mean	31/12/2003
1,3 Butadiene	2.25 ugm^{-3} (1 ppb)	running annual mean	31/12/2003
Carbon Monoxide	11.6 mgm^{-3} (10 ppm)	running 8 hour mean	31/12/2003
Lead	0.5 ugm^{-3}	annual mean	31/12/2004
	0.25 ugm^{-3}	annual mean	31/12/2008
Nitrogen Dioxide	200 ugm^{-3} (105 ppb)	1 hour mean not to be exceeded more then 18 times a year	31/12/2005
	40 ugm^{-3} (21ppb)	annual mean	31/12/2005
PM10[4]	50 ugm^{-3}	24 hour mean Not to be exceeded more then 35 times a year	31/12/2004
	40 ugm^{-3}	annual mean	21/12/2005
Sulphur Dioxide	350 ugm^{-3} (132 ppb)	1 hour mean Not to be exceeded more than 24 times a year	31/12/2004
	125 ugm^{-3} (47 ppb)	24 hour mean Not to be exceeded more than 3 times a year	31/12/2004
	266 ugm^{-3} (100 ppb)	15 minute mean not to be exceeded more than 35 times a year	31/12/2005

3. Nottingham – Topology, Topography and Meteorology

3.1 Topology

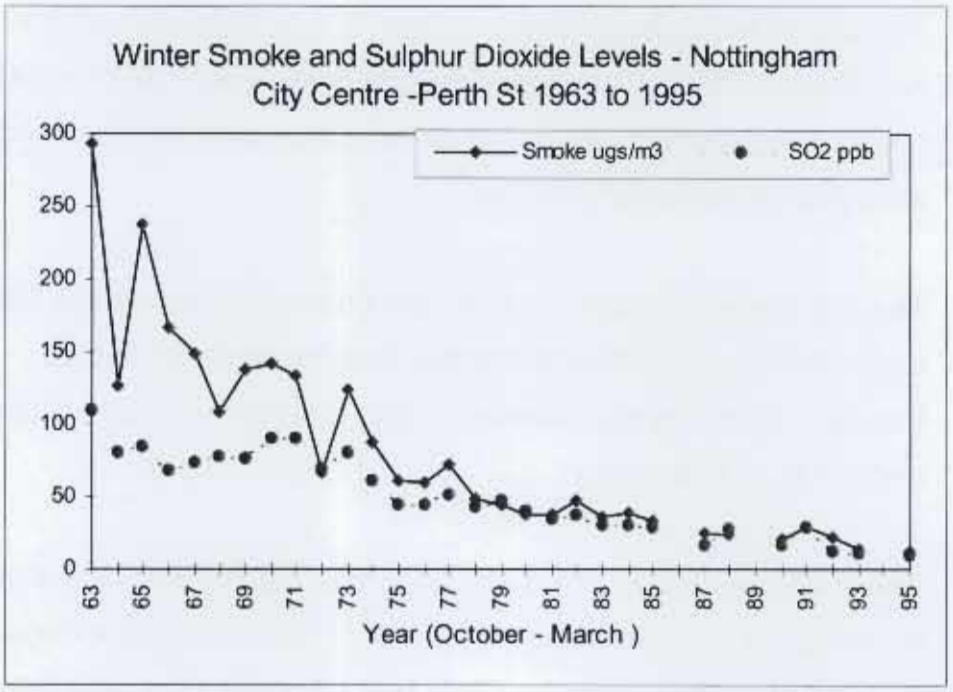
The City of Nottingham covers an area of 7,470 hectares, with a population of 287,000 in 1998. The City boundaries contain urbanised residential, suburban residential, commercial/industrial areas and an area of large suburban parkland.

The City was dominated by the textile industry throughout the 18th and early 19th Century although this has now reduced significantly. Industrial activity is now diverse ranging from some heavy industry through to biotechnology.

There are currently 5 Part A and 65 Part B 'authorised processes' (plus those Part B processes described under the Petrol Vapour Recovery Regulations 1996) within the City's boundary, not all of which emit significant amounts of those pollutants specified in the Air Quality Regulations 1997.

The City of Nottingham started its smoke control programme in 1960 and completed it in 1991.
The whole of the City is now subject to Smoke Control Orders. The programme has resulted in a decline of smoke and SO_2 levels across the City (See Figure 1).
(The breaks in the monitoring data in Figure 1 are caused by variations in pump flow-rate outside the acceptable range of 12.6-15.4m^3 per week).

Figure 1.



Nottingham is a major centre of commerce in the East Midlands and there is a potential for significant levels of traffic pollution. The commercial nature of the City and road links to the M1 and A1 results in large volumes of traffic entering the City via a number of primary arterial routes. The M1 corridor runs to the west of the greater Nottingham conurbation with the A453, A52 and A610 providing direct links to the Motorway junctions 24,25 and 26 respectively. Access from the north/south and east of the county are via the A60/A611, and the A612 and B684 respectively.

The City Centre itself is mainly retail and service sector/office use, with two large shopping centres at the north and south of the city centre. Public transport is focused on three main areas - the Market Square, Victoria Shopping Centre and Broadmarsh Shopping Centre. The Railway Station is located approximately 200 metres south of the Broadmarsh Shopping Centre/Bus Station.

The proposed Light Rapid Transit System will link these transport centres with the northern suburbs and 'park and ride' sites providing an integrated transport system.

The City's industrial past has resulted in mixed commerce/industry/residential areas, and areas of solely commerce/industry, and solely residential. The 'solely' residential areas have over the years, grown outwards towards the satellite towns and form suburbs with the smaller towns of Beeston, Arnold, Carlton and West Bridgford. The conurbation has an overall population of approximately 1,200,000. Residents of these towns work and/or shop in the City of Nottingham forming the Greater Nottingham travel to work area.

Industrial areas are located at Blenheim Industrial Estate, Bulwell; Trent Lane/Daleside Road, Sneinton; Glaisdale Industrial Estate (and nearby Wigman Road), Bilborough; Lenton Lane Industrial Estate (and nearby Thane Road), Lenton; Harrimans Lane Area, Dunkirk; with small pockets in Radford, and Basford.

It is in these areas that the 'Part A' processes and the majority of the 'Part B' processes are located.

3.2 Topography

The Nottingham City Area comprises the River Trent valley basin, which extends outside the city's southern boundary to Rushcliffe District Council and southwest to Broxtowe Borough Council. To the North of the river the land rises to form a ridge running from Lenton Sands northeast to Mapperley. North and north west of this ridge the land forms a large basin through which the River Leen flows.

3.3 Meteorology

Wind direction has a major affect on the transport and dispersion of emissions from fixed sources and mobile sources such as road traffic.

Nottingham like the majority of the UK is subject to prevailing South Westerly winds (see Appendix 3). Changes in wind direction can therefore, allow emissions from Part A and Part B processes in neighbouring boroughs and from more distant sources to affect air quality in the City.

4.0 First Stage Review and Assessment

4.1 Introduction

The primary objectives of the review and assessment of air quality by local authorities is to:

- Identify those areas at the local level where national policies and instruments appear unlikely, by themselves, to deliver the national air quality objective by the end of the relevant period set out in the Air Quality Regulations 1997; and
- Ensure that air quality considerations are integrated into local authorities' decision making processes, such as land use planning and traffic management.

4.1.1 With the exception of ozone, the objectives set out in the National Air Quality Strategy and formalised in the Air Quality Regulations 1997, provide the pollution parameters for reviewing and assessing air quality. (See 4.4)

4.1.2 The air quality standards in the Strategy are set purely with regard to scientific and medical evidence of the effects of the particular pollutant on health. As such, they represent minimum or no significant risk levels. They are not based on an assessment of costs and benefits or issues of technical feasibility.

4.1.3 The air quality objectives in the Strategy, however, represent the Government's present judgement of achievable air quality by the end of 2005 on the evidence of costs and benefits and technical feasibility.

4.2 Purpose

The purpose of the first stage review and assessment is to examine sources of the specified pollutants with reference to the review and assessment: pollutant specific guidance LAQM.TG4(98) that will indicate whether it is necessary to proceed to a second stage.

The authority is required to compile and collate information on any existing or proposed 'significant' sources of concern within its area, and consider whether a person might reasonably be expected to be exposed to a given specific pollutant over the averaging period of the appropriate objective. The authority must also consider pollutant sources outside its area which may lead to an exceedance of a prescribed air quality objective within its area.

The authority has referred to the 'review and assessment: pollutant specific guidance' during its review and assessment. Where a 'source' has been omitted from the guidance but may be a source of a pollutant of concern, the process has been examined further in a second and if appropriate, a Third Stage review and assessment in the vicinity of the uncharacterised source. There are no uncharacterised sources in the Nottingham City Area.

A 'significant' source is likely to be one which, with existing and agreed national and local control policies in place, causes a significant risk, either singly or in combination with other local sources, of an air quality objective failing to be achieved by the end of 2005. The pollutant specific guidance gives an indication of the Part A and Part B prescribed processes most likely to release significant quantities of the specified substances to air. See Appendix 13.

4.3 Information Required

The following information is required for the first stage review and assessment: -

- Details of any significant transport related sources, within the authority's area, including any existing or proposed roads, with existing or predicted levels of traffic flow which, by the end of 2005, could generate significant quantities of a pollutant of concern,
- and any existing or proposed roads, with existing or predicted levels of congestion which, by the end of 2005, could generate significant quantities of a pollutant of concern;
- In respect of roads: this means road links with current or projected Annual Average Daily Traffic Flows greater than 50,000 for CO, 20,000 for NO_2 and 25,000 for PM10. See Appendix 1c.
- Details of industrial sources currently regulated under Part 1 of the Environmental Protection Act 1990, including the name, address and geographical location.
- Details of any other existing or proposed significant sources of a pollutant of concern, including, where appropriate, the location of other processes and pollutant sources, including geographical location.
- Details of any significant sources of a pollutant of concern outside the local authority's area, which could lead to a risk of failure to achieve air quality objectives within the authority's area by 2005,
- A description of the sources of information used by the authority to compile the report; and
- The details of any surveys or investigations undertaken to obtain information to compile the report.

Appendix 1, 1a and 1b details Part A and Part B processes and pollutants of concern.

4.4 Ozone

Ozone is a secondary pollutant formed by the complex interaction of NO_2, NO, some hydrocarbons, and sunlight. The chemistry involved results in its ready formation and persistence in rural areas. Thus while local authorities are able to make a significant impact on the reduction

of ozone precursors at a local level, their action is unlikely to reduce ozone levels in the same locality.

It is a transboundary problem and the responsibility for achieving the ozone objective therefore lies at national and international levels hence its omission from the air quality objectives set out in the Air Quality Regulations 1997.

4.5 Methodology of First Stage Review and Assessment

In 1998 the Nottinghamshire local authorities, with the exception of Nottingham City, commissioned Cambridge Environmental Research Consultants (CERC) to undertake an 'Atmospheric Emission Inventory and Dispersion Modelling Study for Nottinghamshire'. To assist with the study all district local authorities, including the City, undertook a comprehensive survey and data collection exercise. This involved collecting information on 'Part A' processes, 'Part B' processes, other industrial processes and combustion plant with a thermal rating greater than 0.4Mega Watts (MW) within each authority's area. The Atmospheric Research Institute and Consultancy (ARIC) collated this information, and an emission inventory for the county was produced. The Nottinghamshire County Council, who was the Highway Authority at that time, supplied information on significant transport related sources. The information has subsequently been used by this authority for its review and assessment.

Thus all significant road transport sources, Part A and Part B and non-prescribed processes within the City boundary have been considered, together with significant Part A processes up to 50 kilometres and Part B processes up to 10 kilometres from the City boundary. See Appendix 1,1a,1b, and 1c.

5 Benzene

5.1 Objective to be achieved by 2005 (Air Quality Regulations 1997)

5ppb as a running annual mean

5.2 Proposed Objective to be achieved by 2005 (following 1998 review)

Objective: 5ppb as a running annual mean by 31.12.2003

Indicative Level: 1 ppb as a running annual mean by 31.12.2005 (to be achieved as far as practicable)

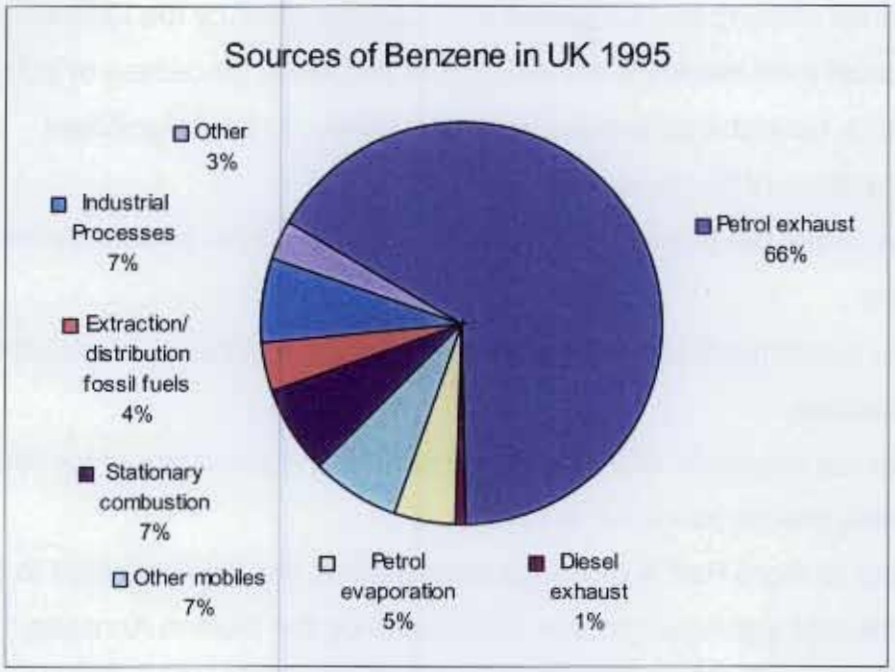
5.3 Description

Benzene is an aromatic hydrocarbon, with a characteristic odour. It exists as a liquid between 5.49° C and 80.2° C. It occurs naturally as a constituent of oil.

5.4 Sources

In the UK the main atmospheric source of benzene is the combustion and distribution of petrol, of which it is a minor component. Benzene constitutes approximately 2% of petrol by volume. Motor vehicle exhaust gases contain some unburned benzene as well as benzene formed by the combustion of other aromatic components of petrol. Motor vehicles fuelled by petrol are the most important single source. Diesel contains relatively small amounts of benzene.

Figure 2.



5.5 Health Effects

Benzene is known to have both carcinogenic and toxic effects. Epidemiological studies of workers exposed to high concentrations of benzene (>20 ppm and probably >100 ppm) for, on the whole, lengthy periods have demonstrated an increased risk of leukaemia.

5.6 The National Perspective

Existing national policies are expected to deliver the prescribed air quality objective by 2005. The review and assessment: pollutant specific guidance LAQM.TG4(98) goes on to state that 'only those authorities with major industrial processes which either handle, store or emit benzene, which have the potential, in conjunction with other sources, to result in elevated levels of benzene in relevant locations, are expected to undertake a second or Third Stage review and assessment'.

5.7 Information required

For all existing and proposed activities identified by the local authority, it shall then identify those existing or proposed processes or activities which have the potential, singly or together, to emit significant quantities of benzene and:

- Are expected to be in existence and/or operational by the end of 2005 and
- For which there is potential for exposure of individuals in relevant locations
- For the purposes of a First Stage review and assessment for benzene these can be assumed to consist of:
- One or more Part A or Part B processes of the type indicated to be a potential significant source of benzene by the table in Annexes 1 and 2
- Planned developments of the above mentioned types in the locality
- It should be noted that the Government is currently investigating ambient levels of benzene in the vicinity of petrol filling stations, and they are not included in the list of Part B processes that may give rise to significant emissions of benzene, pending the outcome of this research.

5.8 Information gathered

Part A processes.

There are no Part A processes within the City area that are significant sources of benzene.

Part B processes

There are no Part B processes within the City area that are significant sources of benzene. There is one, recently authorised process, within 10 kilometres of the City boundary.

Planned developments

There are no planned developments within the City area that will be significant sources of benzene.

5.9 Conclusions

The emissions inventory compiled for the Nottinghamshire area and responses from local authorities within 50 kilometres indicate a single significant source of benzene. This source is a large petroleum storage and transfer facility which exists at OS 462000 439000, approximately 2 kilometres from the City's eastern boundary.

The extent of emissions from this facility can not be readily determined; thus it is not possible to determine whether emissions are significant. However, residential accommodation exists at the City's eastern boundary and it is therefore considered necessary to undertake a Second Stage review and assessment of benzene.

6 Review and assessment of 1,3 Butadiene

6.1 Objective to be achieved by 2005 (Air Quality Regulations 1997)

1ppb as a running annual mean

6.2 Proposed Objective to be achieved by 2005 (following 1998 review)

Objective: 1ppb as a running annual mean by 31.12.2003

6.3 Description

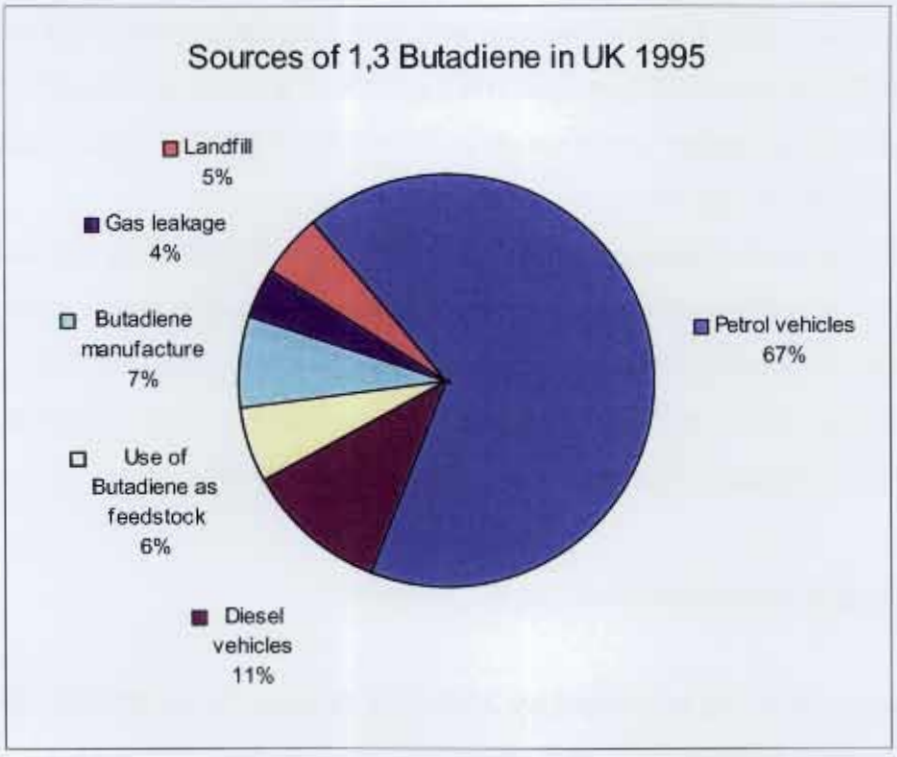
1,3 Butadiene is a colourless gas above $-5^{o}C$. It is produced during the combustion of fossil fuels and as a precursor of synthetic rubber.

6.4 Sources

In the UK the main atmospheric source of 1,3 Butadiene is the combustion of petrol and diesel and the manufacture of synthetic rubber. In 1995 it was estimated that approximately 67% of national

emissions came from petrol vehicles, and just 13% from manufacturing processes. Thus in the majority of urban areas levels of 1,3 Butadiene are predominantly from motor vehicles.

Figure 3.



6.5 Health Effects

1,3 Butadiene has been used in industry for some years and there is evidence that such groups of workers have had a slightly higher then expected risk of cancers of the bone marrow, lymphomas and leukaemia.

The Expert Panel on Air Quality Standards (EPAQS) recommends a standard of 1 ppb as a running annual mean, with a review after 5 years. The review was carried out in 1999, and reflected in the draft regulations.

6.6 The National Perspective

Existing national policies are expected to deliver the prescribed air quality objective by 2005. Roadside levels of 1,3 Butadiene, even next to busy or congested roads are expected to be well below the air quality objective (based on national monitoring data at background monitoring sites). It goes on to state that 'only those authorities with major industrial processes which either handle, store or emit 1,3 butadiene, which have the potential, in conjunction with other sources, to result in elevated levels of 1,3 butadiene in relevant locations, are expected to undertake a Second Stage or Third Stage review and assessment'.

6.7 Information required

For all existing and proposed activities identified by the local authority, it shall identify those existing or proposed processes or activities which have the potential, singly or together, to emit significant quantities of 1,3 butadiene and:

- Are expected to be in existence and/or operational by the end of 2005 and
- For which there is potential for exposure of individuals in relevant locations
- For the purposes of a First Stage review and assessment for 1,3 butadiene these can be assumed to consist of:
- One or more Part A or Part B processes of the type indicated to be a potential significant source of 1,3 butadiene by the table in Annexes 1 and 2 of the pollutant specific guidance LAQM.TG4(98).
- Planned developments of the above mentioned types in the locality.

6.8 Information gathered

Part A processes.

There are no Part A processes within the City area that are significant sources of 1,3 butadiene.

Part B processes

There are no Part B processes within the City area that are significant sources of 1,3 butadiene.

Planned developments

There are no planned developments within the City area or in neighbouring area's that may be significant sources of 1,3 butadiene.

6.9 Conclusion

The emissions inventory compiled by the Nottinghamshire authorities do not detail any significant sources of 1,3 butadiene.
It is not therefore proposed to undertake a Second Stage or Third Stage review and assessment.

7 Review and assessment of Lead

7.1 Objective to be achieved by 2005 (Air Quality Regulations 1997)

0.5 ug m^{-3} as an annual mean.

7.2 Proposed Objective to be achieved by 2005 (following 1998 review)

Objective: 0.5 ug m^{-3} as an annual mean by 31.12.2004.
Objective: 0.25 ug m^{-3} as an annual mean by 31.12.2008.

7.3 Description

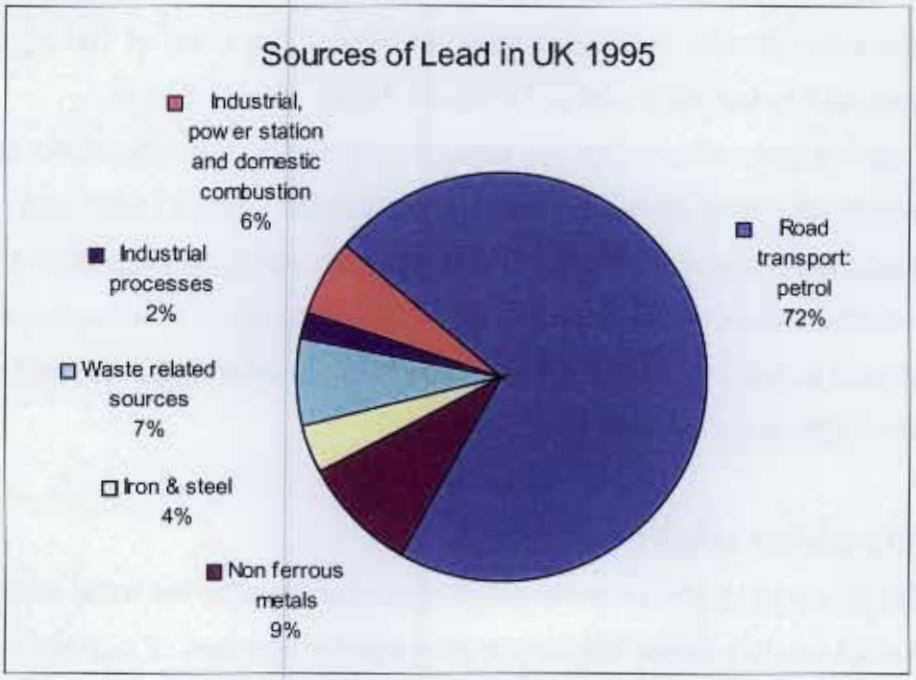
Lead is a non-ferrous metal with a silvery grey lustre. It has a large number of uses in both its elemental form and in alloys and compounds.

7.4 Sources

In the UK the main atmospheric source of lead was from petrol engined motor vehicles. Prior to 1st January 2000 tetraethyl and tetramethyl lead was added to petrol to improve combustion. Following this date it was withdrawn from sale.

Most of the lead in air is in the form of fine particles with an aerodynamic diameter of less than 1 micron. In the immediate vicinity of smelters, the emissions show a predominance of large particle sizes. However these are rapidly deposited and after approximately 2 kilometres the particle size distribution is similar to that at urban sites mainly influenced by traffic emissions of lead.

Figure 4.



7.5 Health Effects

Lead has been used by society over several thousand years and its effects on workers in industry well documented. Its main effects are upon the haematopoietic system, the nervous system and renal system. Concern in recent years has been centred upon its effect upon children. Studies indicate that child with high levels of lead in blood or accumulated in their teeth experience more behavioural problems, lower IQ's and decreased ability to concentrate.

7.6 The National Perspective

The recognition of the adverse effects on human health, and the increasing use of catalytic converters, which are poisoned by lead, has resulted in a reduction in the lead content of leaded fuel and an ever decreasing use of leaded fuel, as the national fleet is replaced by modern vehicles. This reduction in lead in fuel was reinforced by the introduction of unleaded petrol in 1987. The market share of this fuel was guaranteed by the requirement in 1993 that all new cars must be fitted with catalytic converters. Following the reduction in the lead content of petrol, urban levels have reduced to the extent that the maximum annual average values are now of the order of 150 ng/m^3, even at the kerbside site at Cromwell Road, West London.

Existing national policies are expected to deliver the prescribed air quality objective for lead at all rural, urban background sites and roadside locations by 2005. Only local authorities with significant industrial sources, which have the potential to result in elevated levels of lead in relevant locations are expected to undertake a second or Third Stage review and assessment'.

7.7 Information required

For all existing and proposed activities identified by the local authority, it shall identify those existing or proposed processes or activities which have the potential, singly or together, to emit significant quantities of lead and:

- Are expected to be in existence and/or operational by the end of 2005 and
- For which there is potential for exposure of individuals in relevant locations
- For the purposes of a First Stage review and assessment for lead these can be assumed to consist of:
- Part A or Part B processes of the type indicated to be a potential significant source of lead by the table in Appendices 12 and 13
- Industrial or other sites with non-prescribed processes with the potential to emit significant quantities of lead

- planned developments of the above mentioned types in the locality.

7.8 Information gathered

Part A processes.

There are no Part A processes within the City area that are significant sources of lead.

Part B processes

There are no Part B processes within the City area that are significant sources of lead.

Industrial or other sites

There are no non-prescribed processes with the potential to emit significant quantities of lead.

Planned developments

There are no planned developments within the City area or in neighbouring area's that may be significant sources of lead.

7.9 Conclusion

The emissions inventory compiled by the Nottinghamshire authorities does not detail any significant sources of lead.

It is not therefore proposed to undertake a Second Stage or Third Stage review and assessment.

8 Review and assessment of Carbon Monoxide (CO)

8.1 Objective to be achieved by 2005 (Air Quality Regulations 1997)

10ppm as a running 8-hour mean

8.2 Proposed Objective to be achieved by 2005 (following 1998 review)

Objective: 10 ppm as a running annual mean by 31.12.2003

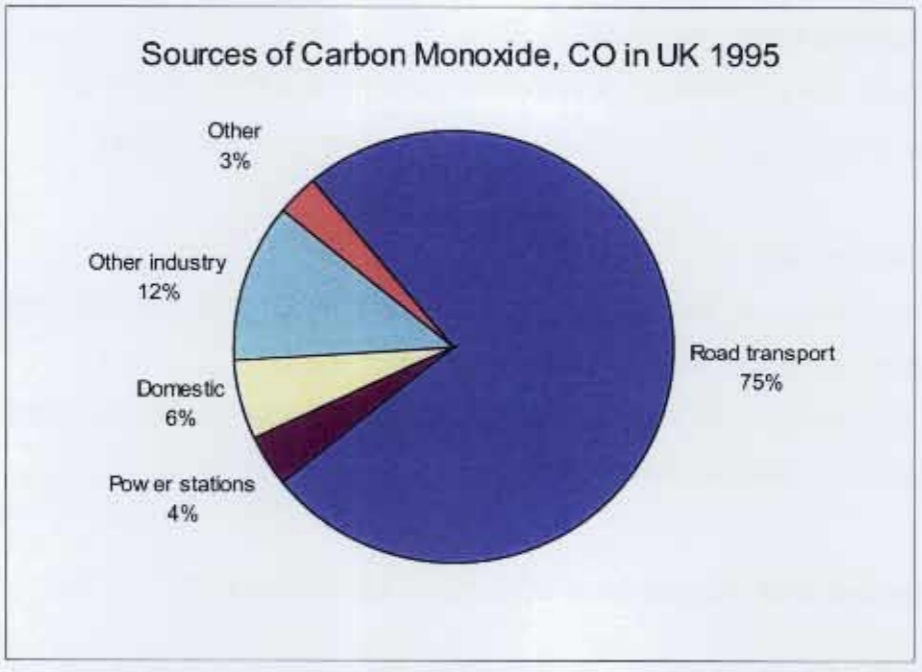
8.3 Description

Carbon monoxide is a colourless, odourless, tasteless gas.

8.4 Sources

In the UK the main source of carbon monoxide is road transport which accounted for 71% of the total emission of 4.6 million tonnes in 1996. Road transport sources constitute a larger proportion of the total in most cities and maximum 8-hour concentrations are therefore expected near busy, congested roads.

Figure 5.



8.5 Health Effects

When CO is inhaled it enters the blood stream and may disrupt the supply of oxygen to the body's tissues.

The health effects of CO result principally from the displacement of oxygen from haemoglobin, forming carboxyhaemoglobin. The consequent reduced oxygen availability can give rise to a wide range of health effects. Individuals most at risk from the effects of CO include those with existing cardiovascular or chronic respiratory problems.

8.6 The National Perspective

National initiatives are expected to deliver the national air quality objective by 2005 with the possible exception, in some years, in the near vicinity of heavily trafficked roads or in the vicinity of certain stationary sources.

8.7 Information required

For all existing and proposed activities identified by the local authority it should identify those existing or proposed processes or activities which have the potential, to emit significant quantities of CO specifically

- Road links with current or projected annual average daily traffic flow (AADT) greater than 50,000
- 'Part A' processes with the potential to emit significant quantities of CO
- Planned developments of the above mentioned types in the locality, including those which will increase traffic flow.

8.8 Information gathered

Road traffic sources

- Data for roadlinks for which AADT's have been determined were obtained and detailed in Appendix 1c.
- Monitoring data from the Nottingham City's Air Quality Mobile Station and DETR AURN unit (Appendix 5).
- National background concentrations due to dispersed road transport sources derived from National Emissions Inventory (NEI).

Part A processes

Part A prescribed processes are detailed in Appendix 1. Part A processes meeting the criteria 'potential to emit significant quantities of CO' are detailed in Appendix 1.

Planned developments

There are two planned developments, Chilwell Dam Farm, Strelley and Clifton West, which may increase traffic flow. These are detailed in Appendix 12.

8.9 Conclusion

There are no Part A processes within the City area nor outside the city area which could impact significantly within the authority's area. However, a number of roads meet the above criteria and it is therefore necessary to undertake a Second Stage review and assessment of carbon monoxide.

9 Review and assessment of Sulphur Dioxide (SO_2)

9.1 Objective to be achieved by 2005 (Air Quality Regulations 1997)

100ppb as a 15-minute mean 99.9th percentile (35 exceedances allowed per year).

9.2 Proposed amendments to Objective to be achieved by 2005 (following 1998 review)

Objective: 350 $u gm^{-3}$ (132 ppb) as a 1-hour mean, not to be exceeded more than 24 times per year, by 31.12.2004,

Objective: 125 $u gm^{-3}$ (47 ppb) as a 24-hour mean, not to be exceeded more than 3 times per year, by 31.12.2004

Objective: 266 $u gm^{-3}$ (100 ppb) as a 15-minute mean, not to be exceeded more than 35 times per year, by 31.12.2005

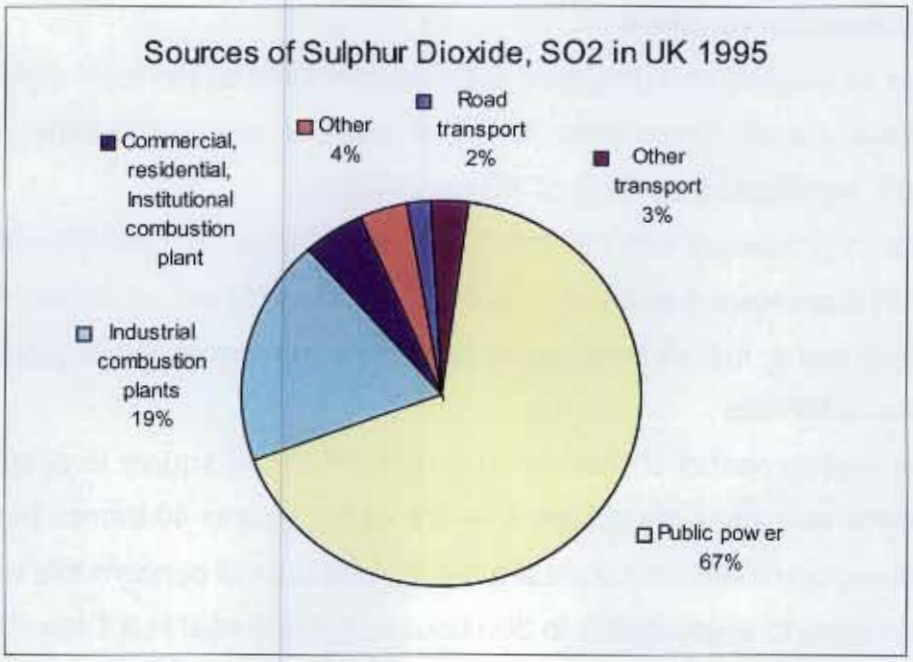
9.3 Description

Sulphur dioxide is a colourless gas with a pungent odour. It reacts on the surface of a variety of airborne solid particles, is soluble in water and can be oxidised within airborne water droplets.

9.4 Sources

In the UK the most important source of emissions of SO_2 are fossil fuel combustion, smelting non-ferrous ores, manufacture of sulphuric acid, conversion of wood pulp to paper, incineration of refuse, production of elemental sulphur. Coal burning is the single largest source of atmospheric SO_2, accounting for about 50% of annual global emissions in recent years, with oil burning accounting for a further 25-30% of emissions.

Figure 6.



9.5 Health Effects

Concentrations of more than 4000 ppb (10,000 ug m^{-3}) SO_2 can give rise to severe effects in the form of bronchoconstriction, chemical

bronchitis and chemical tracheitis. Concentrations of 1000 ppb (2700 ug m^{-3}) give rise to immediate clinical symptoms with bronchospasm in asthmatics.

High concentrations of SO_2 (>400 ppb) together with high concentrations of suspended particles are believed to have been responsible for high mortality levels during the London smogs of the 1950's. The December 1952 smog was associated with 4000 excess deaths.

9.6 The National Perspective

Exceedances of the air quality standard currently occur in the vicinity of industrial processes for which the stack heights were designed to meet previous air quality standards and in areas where significant quantities of coal are used for space heating. Sulphur dioxide concentrations are elevated at the kerbside but not sufficiently to exceed the air quality standard in the absence of other sources.

9.7 Information required

For all existing and proposed activities identified by the local authority it should identify those which have the potential, singly or together to emit significant quantities of SO_2, specifically

- Part A processes with the potential to emit significant quantities of SO_2
- Part B processes with the potential to emit significant quantities of SO_2
- Solid fuel or fuel oil combustion systems with thermal power greater than 5 MWatts
- An assessment of emissions on a 1km x 1km grid square to determine where emissions are greater than 25 kg per hour or 40 tonnes per year. Where domestic emissions are the main source of concern this can be assumed to approximate to 300 houses burning coal in a 1 km x 1 km grid square.

9.8 Information gathered

- Part A prescribed processes are detailed in Appendix 1. Part A processes meeting the criteria 'potential to emit significant quantities of

SO_2' are detailed in Appendix 1. There are three Part A processes outside the City area which could impact significantly within the authority's area.

- A city wide survey of chimney heights and boiler plant was undertaken during March/April 1998 (as part of the ARICS/CERC countywide information gathering exercise). No boiler plant was identified as exceeding 5 MWatts during this exercise. However, a single boiler plant comprising 4 no. 7.1 MWatt coal fired boiler plant was identified in February 2000.
- Monitoring data from the Nottingham City air quality mobile station, 8 port peroxide bubbler equipment and DETR AURN unit (see second stage review and assessment).
- National background concentrations derived from NEI.
- Domestic coal usage in neighbouring areas.

9.9 Conclusion

It is therefore necessary to undertake a Second Stage review and assessment of sulphur dioxide.

10 Review and assessment of Nitrogen Dioxide (NO_2)

10.1 Objective to be achieved by 2005 (Air Quality Regulations 1997)

Objective: 150ppb as a 1-hour mean, no exceedances allowed per year

Objective: 21 ppb as an annual mean

10.2 Proposed Objective to be achieved by 2005 (following 1998 review)

Objective: 200 $u gm^{-3}$ (105 ppb) not to be exceeded more than 18 times a year, as a 1-hour mean by 31.12.2005,

Objective: 40 $u gm^{-3}$ (21ppb) as an annual mean by 31.12.2005

10.3 Description

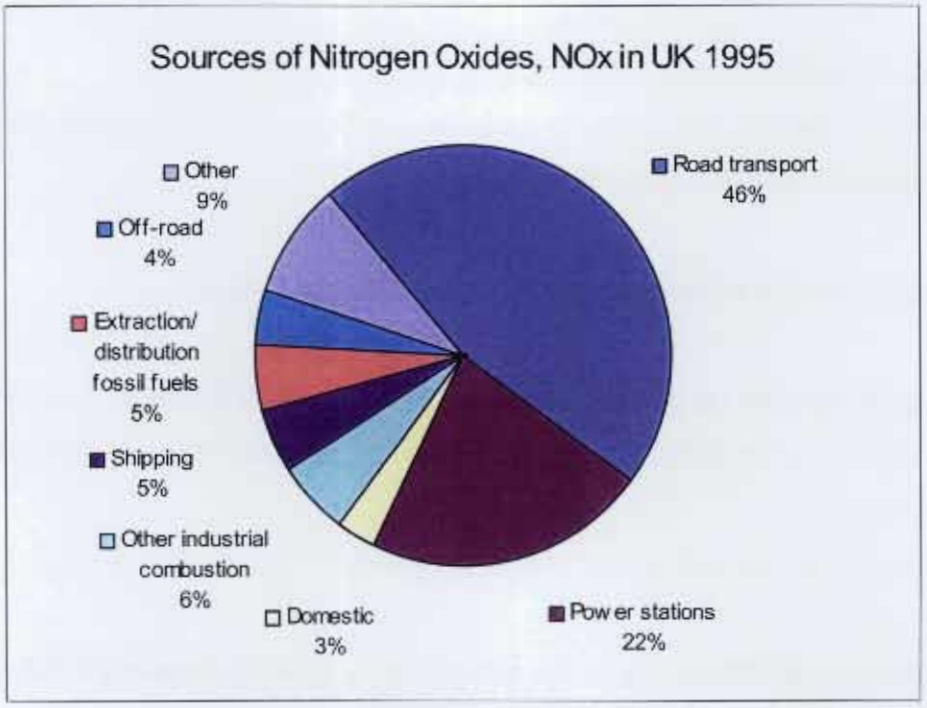
Nitrogen dioxide (NO_2) and nitric oxide (NO) are both oxides of nitrogen and are referred to collectively as nitrogen oxides (NOx). The conversion of NO to NO_2 takes place in the atmosphere via a reaction with a chemically active species such as ozone.

Nitrogen dioxide is a reddish-brown gas. It is a strong oxidant and is soluble in water.

10.4 Sources

NOx is produced from all combustion processes. In urban/ industrial areas the proportion of total emissions that arise from road traffic is between 60 and 80%. Power generation is also a significant source.

Figure 7.



10.5 Human Health Effects

Nitrogen dioxide is generally considered to be more important as regards the effect on human health. Consequently ambient concentrations, standards and objectives refer to NO_2 rather than NOx. NO_2 affects the respiratory system. It can irritate the airways and increase the symptoms of those suffering from lung diseases.

10.6 The National Perspective

The National Air Quality strategy suggests that national measures alone will not be sufficient to ensure that the air quality objectives for NO_2 are met. There will need to be an additional reduction in NOx levels if the set objectives are to be achieved by the end of 2005. Local authorities with major roads or roads that are highly congested will probably need to undertake more than a First Stage review and assessment.

Winter episodes with poor air dispersion or summer oxidant episodes are most likely to be associated with exceedances of the 1-hour AQ objective for NO_2.

10.7 Information required

For all existing and proposed activities identified by the local authority, the authority should identify those existing or proposed processes which have the potential, singly or together to emit significant quantities of NOx and

- Are expected to be in existence/ or operation by the end of 2005;
- And for the which there is potential of exposure of individuals in relevant locations

For the purpose of this stage of the review these are considered to be:

- an annual mean urban NO_2 concentration in 1996 of greater than 30 ppb;
- one or more existing or planned roads with a projected annual average daily traffic flow of greater than 20, 000 in 2005;
- One or more Part A or Part B processes of the type indicated to be a potential significant source of NOx in Appendix 1, 1a, 1b.
- an indication of existing sources acting in combination to exceed a current annual mean NO_2 concentration of 30 ppb (for example as measured by diffusion tubes or automatic measurement methods).

10.8 Information gathered

Currently there are 123 existing roads with annual average daily traffic flow of greater than 20,000 and 134 roads with projected flows greater than 20,000 by year 2005. Traffic flow figures for 1997 and projected for 2005 are collected within the authority.

There is one Part A process that is considered a potential significant source of NO_2 . There are no Part B processes that are considered to be potential significant source of NO_2 in the authority's area. See 'significant emission column' in Appendix 1, 1a, 1b.

The annual mean NO_2 concentration for 1998 for the city area was 25 ppb, from the AURN.

Table 4 shows that annual average kerbside NO_2 levels (measured by Roadside Pollution Monitors) vary between 18 and 56 ppb.

There are a significant number of roads, both current and projected with traffic flows in excess of 20,000. From assessment of the roadside NO_2 monitoring information (Appendix 7) it is apparent that there are areas of the city where the current annual mean is greater than 30 ppb. These observations together with the contribution from Part A and B processes indicate that a further detailed assessment will be needed for this pollutant.

10.9 Conclusion

A Third Stage review and assessment should be undertaken for nitrogen dioxide.

11 Review and assessment of Particles (PM10)

11.1 Objective to be achieved by 2005 (Air Quality Regulations 1997)

50 ug m^{-3} as a running 24-hour mean 99^{th} percentile, (4 exceedances allowed per year).

11.2 Proposed Objective to be achieved by 2005 (following 1998 review)

Objective: 50 $u gm^{-3}$ not to be exceeded more than 35 times a year, as a 24-hour mean by 31.12.2004,
Objective: 40 $u gm^{-3}$, as an annual mean by 31.12.2004.

11.3 Description

Particles in the atmosphere are a complex mixture of organic and inorganic substances and are present as both liquids and solids. Fine particles (diameter of < 2.5 um) includes aerosols, combustion particles and organic and metallic vapours. Coarse particles, aerodynamic diameter >2.5 um usually contain dust from industry and roads and the Earth's crust. PM10 refers to particles with an aerodynamic diameter of <10um.

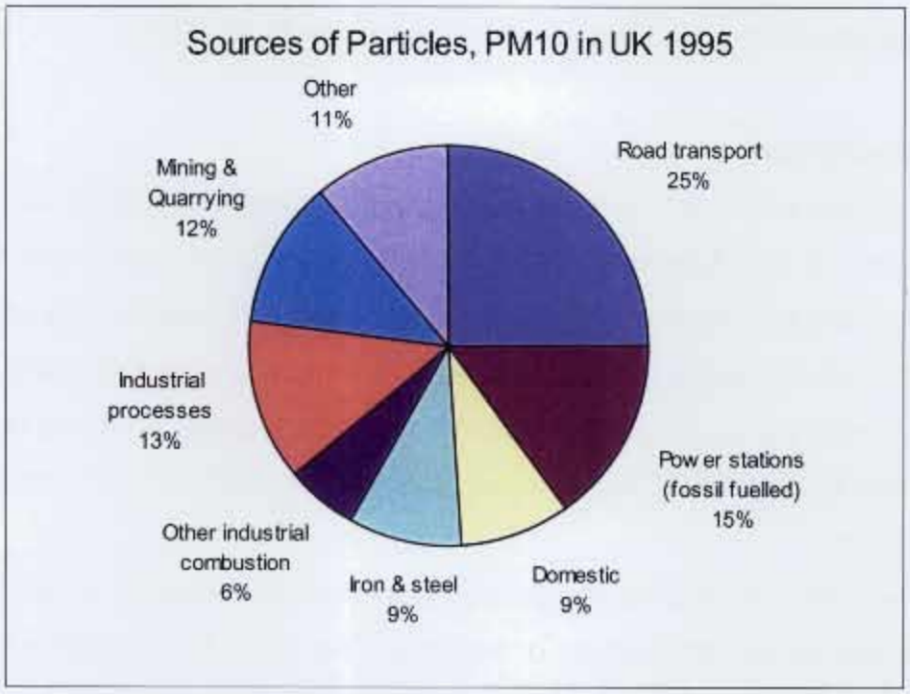
Particles may also be categorised as primary particles i.e. emitted directly to the atmosphere or secondary particles, for example nitrates and sulphates, which are formed by chemical reactions in the atmosphere.

11.4 Sources

Particles are emitted from a wide range of sources. These include non-nuclear power stations, transport, cement factories, open cast coal mines and industrial processes. Vehicles are a major source of particles in urban areas. Particles arise from brake and tyre wear and dust from roads as well as from combustion of fuels.

Natural sources include sea spray, volcanoes, dust storms and pollen.

Figure 8.



11.5 Human Health Effects

Fine particles can enter thoracic airways and may be carried deep into the lungs. Research has shown that high concentrations of particles can be associated with poor health including respiratory and cardiovascular effects.

11.6 The National Perspective

Current Government advice suggests that the PM10 objective will be the most difficult for Local Authorities to achieve. Data from the national monitoring networks show that the standard is being exceeded at all of the sites. The majority of monitoring stations are sited where road transport and domestic combustion are the main sources in the immediate vicinity.

Local urban sources of particles are generally responsible for winter pollution episodes where PM10 levels are high and there is poor dispersion.

A significant proportion of measured annual average PM10 levels are due to the secondary particle formation of sulphates and nitrates from

sulphur and nitrogen oxides. This occurs at a regional level. Estimates of future PM10 concentrations are dependent on predictions of the secondary particle component.

It is recognised that many of the sources of PM10 are outside the control of individual local authorities.

11.7 Information Requirements

For all existing and proposed activities identified by the local authority, the authority should identify those existing or proposed processes which have the potential, singly or together to emit significant quantities of PM10

- And are expected to be in existence/ or operation by the end of 2005;
- And for the which there is potential of exposure of individuals in relevant locations.

For the purposes of this stage of the review these are considered to be:

- Urban areas for which the annual average regional background due to secondary particles is currently greater than 8 ug m^{-3};
- Emissions from low-level dispersed sources (including road traffic) greater than 10 tonnes in any single 1km x 1km grid square or an average of 5 tonnes in several adjacent squares;
- One or more existing or planned roads with a projected annual average daily traffic flow of greater than 25, 000;
- One or more Part A or Part B processes of the type indicated to be a potential significant source of PM10 by the Table in Appendix 1, 1a, 1b.
- Any industrial process that emits significant quantities of dust in the form of PM10 from uncontrolled or fugitive sources within the plant.

11.8 Information gathered

From the national maps, the most recent figures (1996) for the annual average regional background due to secondary particles in this authority's area is 10 - 11 $u gm^{-3}$.

- The current annual average urban background concentration of PM10 is approximately 23 - 26 $u gm^{-3}$ derived from national maps and local measurements.

- There are 6x1km^2 grid squares in which emissions from low level dispersed sources are greater than 10 tonnes and 8x1 km^2 where emissions are greater than 5 tonnes (Appendix 10). This information was determined from the National Atmospheric Emission Inventory.
- Currently there are 84 existing roads with annual average daily traffic flow of greater than 25,000 and 97 roads with projected flows greater than 25,000 by year 2005. Traffic flow figures for 1997 and projected for 2005 are collected within the authority.
- Developments that may happen are a fourth Trent crossing and alterations to the A453.
- There is one Part A process (and no Part B processes) considered a potential significant source of PM10 in the authority's area. This is listed in Appendix 1.
- In neighbouring authorities, there are no Part A and no Part B processes considered to be sources of PM10 likely to impact significantly upon air quality in the City area.
- No industrial processes that emit significant quantities of dust as PM10 from uncontrolled or fugitive sources have been identified.
- From the above it can be seen that there are a number of activities and one process that may potentially lead to the exceedence of the PM10 air quality objective. It is clear from the information gathered for this stage of the review that further detailed assessment will be needed for this pollutant.

11.9 Conclusion

A Third Stage review and assessment is required to be carried out for PM10.

12 First Stage Review and Assessment : summary of key points

The purpose of the First Stage review and assessment was to gather and compile information on the existing, and future (by 2005), sources of the pollutants of concern.

Where there are no existing, or future, significant sources of a given pollutant of concern the likelihood of exceeding an air quality objective is considered to be negligible.

The need to proceed to a Second Stage or Third Stage review and assessment is thus determined by the existence, future existence, of Part A, Part B, and other 'significant' sources, and the value of the annual average daily traffic flow.

13 Statement of reasons whether to proceed to Second Stage or Third Stage Review and Assessment

13.1 Benzene

The First Stage review and assessment identified a single significant source see Appendix 1. The scale and nature of the operation may give rise to fugitive emissions of benzene to atmosphere. It will therefore be subject to a Second Stage review and assessment.

13.2 1,3 Butadiene

The First Stage review and assessment did not identify any sources of 1,3 Butadiene, other than road transport. Existing national policies are expected to deliver the prescribed air quality objective for 1,3 Butadiene, and it is not proposed to undertake a Second Stage or Third Stage review and assessment.

13.3 Lead

The First Stage review and assessment did not identify any Part A, Part B processes, or significant sources of lead. Existing national policies are expected to deliver the prescribed air quality objective for lead and it is not proposed to undertake a Second Stage or Third Stage review and assessment.

13.4 Carbon Monoxide

The First Stage review and assessment identified a number of roads and other significant sources (see Appendix 1c). The road links and future increases in traffic flow may give rise to a risk of an exceedance of the air quality objective. It will therefore be subject to a Second Stage review and assessment.

13.5 Sulphur Dioxide

The First Stage review and assessment identified a number of Part A processes and one combustion process likely to have a significant impact on air quality in the City area (see Appendix 1).
It will therefore be subject to a Second Stage review and assessment.

13.6 Nitrogen Dioxide

The First Stage review and assessment identified a number of existing road links and future increases in traffic flow that are likely to give rise to a risk of an exceedance of the air quality objective. Results from monitoring equipment indicate current exceedances of the air quality objectives. It is therefore proposed to proceed to a detailed Third Stage review and assessment.

13.7 Particles (PM10)

The First Stage review and assessment identified a number of existing road links and future increases in traffic flow, existing urban background concentrations and secondary particle concentrations are likely to give rise to a risk of an exceedance of the air quality objective. The results from existing monitoring equipment indicate current exceedances of the air quality objective. It is therefore proposed to proceed to a detailed Third Stage review and assessment.

14 SECOND STAGE REVIEW AND ASSESSMENT

14.1 Introduction

It has been determined that sulphur dioxide, carbon monoxide and benzene require a Second Stage review and assessment. Reference has been made to the Review and Assessment: pollutant specific guidance LAQM.TG1(98).

14.2 Purpose

The purpose of the Second Stage review and assessment is to provide a further screening of pollutant concentrations within the City's boundaries. 'It is not intended that it should provide an accurate prediction of levels of current or future air quality across the whole of the authority's area.'

It is necessary for local authorities to select a number of areas within their boundaries, where the highest likely concentrations of each pollutant of concern, highlighted by the First Stage, are likely, in relevant locations, to occur.

Four areas have been considered:

1. The City Centre, a mixed commercial, industrial, and residential area
2. Dunkirk, a mixed commercial, industrial and residential area with a major road link running through the area
3. Sneinton, a suburban residential area.

These areas have been chosen because they are representative of the typical mix of areas within the City and because monitoring data is readily available.

4. Edwards Lane Estate/Sherwood in the vicinity of Nottingham City Hospital boiler plant.

These areas have been assessed to determine whether there is a significant risk of the relevant air quality objective not being achieved by the end of 2005.

Estimates were made, in the selected areas, of ground level concentrations using a combination of roadside/industrial/urban background locations and the screening tool 'Air Quality Impacts of Stationary Sources'. The estimated concentration in these locations allows Nottingham City Council to verify predicted current pollutant concentrations against existing monitoring data, and estimate pollutant concentrations by the end of 2005.

14.3 POLLUTANT: SULPHUR DIOXIDE

Sulphur dioxide concentrations were assessed based on two methodologies, appropriate for the source or location :-

1 Monitoring data from monitoring equipment located in 'appropriate' areas 'where the highest pollution concentrations are likely' was used to establish existing pollutant concentrations in those 'appropriate' areas.

2 The use of a screening tool for point source emissions that are classed as 'Industrial Processes and other Potentially Polluting Combustion Systems'; used to establish ground level concentrations in the vicinity of the City Hospital boiler plant.

MONITORING EQUIPMENT – AUTOMATIC / NON-AUTOMATIC AND LOCATION

Nottingham City currently operates 1 semi-automatic smoke and SO_2 bubbler, its own SO_2 analyser located within the Air Quality Mobile Station (AQMS), and provides Local Site Operators for the DETR AURN station. Their locations are detailed in Appendix 11, together with their OS co-ordinates.

The semi-automatic smoke and SO_2 bubbler and AURN equipment are located in central urban sites surrounded by commercial buildings, and in close proximity to roads.

The Air Quality Mobile Station is, as its name suggests, mobile and was located at Dunkirk Fire station during the period 1997-1998, and at Sneinton Police Station during the period 1998-1999. The Dunkirk site is a suburban mixed industrial/commercial /residential area of the City adjacent to the A52 ring road. The Sneinton site is a suburban residential area to the east of the City centre.

The locations of the monitoring equipment was determined by a number of factors particularly the sites' relation to sources, and security.

Studies by the Power Generators (National Power and Power Gen) during their Joint Environmental Programme (JEP) show that under certain meteorological conditions and at a distance from the source, the plume from a point source will be detected at ground level more frequently, but will usually be highly diluted. Their computer models predicted the highest ground level concentrations (of approximately 1 to 2 ppb) occurred approximately 4 km from the point of emission (assuming a typical stack height of 200 metres).

The JEP study's main conclusions were that:-

1. '..individual power stations make only a small contribution to annual mean sulphur dioxide concentrations, of the order of a few ppb at most.
2. 'The contributions of individual power stations to annual mean sulphur dioxide concentrations are hard to detect above the background..'
3. 'The distance to the point of maximum impact on annual mean concentrations depends on station size and chimney height...Typically, the distance to the point of maximum impact will be between about 5 and 15 km from the power station.'

However, the three 'northern' sources are approximately 40 km, and the west south westerly source is approximately 15 km, from Nottingham City, thus annual mean concentrations monitored at the three sites in the City area will be dominated by SO_2 emitted from local sources.

14.4 DESCRIPTION OF EQUIPMENT

The semi-automatic smoke and SO_2 bubbler, was designed during the 1950's to allow local authorities to assess smoke and SO_2 concentrations. It comprises a pump, timer controlled valve/switch, and 8 filter units and bottles. Smoke concentration is determined by measuring the reflectance of filter paper exposed to ambient air drawn through the apparatus over a 24-hour period. SO_2 concentrations are determined indirectly by a chemical reaction between hydrogen peroxide and SO_2 absorbed from ambient air drawn through the apparatus over a 24-hour period. The acidic solution is titrated with sodium tetra-borate, to determine the change in pH of the solution. The concentration of SO_2 is then calculated.

The automatic monitoring equipment located in the AQMS and AURN uses a technique called Ultra Violet Fluorescence. Ambient air is drawn into the analyser and exposed to ultra violet light. The SO_2 molecules absorb the energy of this light and the molecules' electrons move to an 'excited' state. The 'excitation energy' is rapidly lost again as the electrons fall back to their stable 'unexcited' state by emitting light radiation. This light is detected by a photo-multiplier tube, which generates an output voltage proportional to the concentration of SO_2 in the air sample. A permeable membrane 'kicker' is used to remove other gases, which also fluoresce, and thus interfere with the detection of SO_2 molecules.

14.5 POLLUTANT SPECIES MEASURED

The semi-automatic smoke and SO_2 bubbler measures a range of sizes of 'smoke' particles and uses the change in pH of hydrogen peroxide,

and subsequent titration back to pH 4.5 to determine the concentration of SO_2.

The UV fluorescence technique measures the amount of fluorescence of SO_2 within a chamber of known volume, thus allowing the direct determination of the concentration of SO_2.

14.6 POLLUTANT CONCENTRATIONS AND AVERAGING TIMES

In the automatic UV fluorescence monitoring units sulphur dioxide concentrations are measured in parts per billion (ppb), and averaged by the instrument over a 15-minute period. In the semi-automatic smoke and SO_2 bubbler, it is calculated in microgrammes per cubic metre and averaged over a 24-hour period.

14.7 MONITORING PERIOD

The Perth Street semi-automatic smoke and SO_2 bubbler, has been operational since 1963 until present and has shown a year on year reduction in SO_2 until approximately 1993 when levels 'bottomed' out with an average yearly concentration of 15 ppm.

The AURN station has been operational since October 1996.

The site has a high level of data capture of 97.6% during 1997, and 98.1% during 1998.

The AQMS unit was commissioned in 1996 at the Dunkirk site and remained there until June 1998, providing approximately 80% data capture during the period 1997 to 1998. It was then relocated to Sneinton police station where at the time of publication of this report, it was operational, providing approximately 80% data capture during the period 1998-1999.

14.8 INFORMATION COLLECTED

Daily concentrations of SO_2 have been collected from the semi-automatic peroxide bubbler.

Information from the AQMS is collected both hourly and daily as 15 minute monitoring periods. The DETR AURN measurements are

downloaded periodically from the NETCEN web site in the form of hourly and 15 minute averages.

14.9 ESTIMATION OF ACCURACY AND PRECISION OF RESULTS

Accuracy is defined as 'the closeness of agreement between a single measured value and the actual air quality characteristic or its accepted reference value' (from ISO 6879).

Precision is defined as 'the closeness of agreement between mutually independent test results obtained by repeating a measurement several times under stipulated conditions' (from ISO 6879).

The semi-automatic smoke and SO_2 bubbler uses an indirect measurement and subsequent calculation to determine the concentration of SO_2 in a known volume of air. The documentation supplied with the system quotes an accuracy of + or – 25 % (NETCEN) and a precision of + or - 0.1 microgrammes per cubic metre. LAQM.TG1(98) quotes an accuracy of + or – 10 and and a precision of + or – 4 microgrammes per cubic metre, for this apparatus.

The 99.9^{th} percentile of the 15 minute averages and the annual maximum daily average are correlated and related by the function P99.9=[daily max]x1.655+19.45 (r2=0.916, df=97)(Willis et al, 1998) However it can be assumed that the air quality objective is not likely to be exceeded if the maximum daily mean is less than 48 ppb.

The UV fluorescence systems have a quoted accuracy of + or – 10 % and a precision of + or – 1.2 ppb.

14.10 QUALITY CONTROL, MAINTENANCE, CALIBRATION

Data from the semi-automatic smoke and SO_2 bubbler is recorded weekly to a proforma, and returned monthly to AEA.

Each months data returns require the previous months meter readings and the end period's meter readings – if the flow rate is outside the range of 12.6 m^3 to 15.4 m^3 the readings are invalid and the equipment may require servicing.

Titration of the hydrogen peroxide with sodium tetraborate requires care to ensure the solution is brought back to pH 4.5. An indicator, which changes colour from grey to pink, is used to determine the correct pH – adequate lighting is required to accurately observe this.
The DETR AURN SO_2 monitor is subject to a bi-monthly calibration. The calibration is undertaken by suitably trained Local Site Operators (LSO's) and conducted in accordance with the Local Site Operators manual. The equipment is serviced twice per year. The site is also audited by NETCEN on an annual basis to ensure LSO's are conducting the calibrations correctly.
The Mobile Air Quality SO_2 monitor is subject to a bi-monthly calibration. The calibrations are undertaken by officers trained as LSO's for the DETR AURN and are conducted in accordance with the manufacturers operating manual. The equipment automatically performs overnight zero and span checks. The equipment is serviced six monthly by the equipment supplier.

14.11 CALIBRATION GAS TRACEABILITY

Span or calibration gas used in the DETR AURN is supplied by BOC who have demonstrated compliance with relevant quality control procedures in the preparation of gas mixtures and certified by NPL. Span or calibration gases used in the AQMS are supplied by Messer UK Ltd. Each cylinder is supplied with a certificate of analysis.

14.12 DATA PROCESSING TECHNIQUES

The analysers measuring cycle takes just a few minutes. The fluctuations in concentration are converted to an output voltage and sent to an 'Odessa' data logger. The logger records the voltage variations over time and calculates and records the 15-minute average.

The DETR AURN station's data logger is interrogated on an hourly basis by Stanger Central Management and Co-ordination Unit (CMCU). The data logger records information from all the analysers operating at the site, including the sulphur dioxide analyser.

The data obtained is 'validated' by CMCU and passed to the Data Dissemination Unit (DDU) who disseminate the information via air quality bulletins. Information from the DETR AURN station is reported as an hourly average concentration.

The City's AQMS's data logger is interrogated on an hourly and daily basis by the Siemens Environmental Measurement Database v2.63 program. The software scales the collected data with reference to calibration data entered following bi-monthly calibration.

The fluctuations in concentrations of the pollutant are subsequently averaged by EMD and displayed as an hourly average.

14.13 SCREENING TOOLS

A single combustion plant has now been identified as meeting the 5 MWatt criteria, necessitating an assessment of ground level concentrations of SO_2 now, and in 2005.
The methodology described in 'Air Quality Impacts of Stationary Sources' (Environment Agency November 1998) was used.

14.14 RESULTS

Tables 7 and 8 detail the results from the volumetric monitor, DETR AURN monitor, and the Air Quality Mobile Station.
Table X details the estimated ground level concentrations of SO_2 in the vicinity of the City Hospital boiler plant.

The monitored SO_2 levels from the automatic monitoring equipment range from 3 to 6 ppb as an annual hourly mean.
The data from the DETR AURN station has been processed by NETCEN to provide the annual 99.9^{th} percentile below:

1997: 62 ppb
1998: 68 ppb

14.15 CONCLUSION

The monitored levels are significantly lower than the 2005 air quality objective of 100 ppb expressed as the 99.9th percentile.
The screening tool methodology predicts maximum ground level concentrations in the vicinity of the City Hospital boiler plant that may pose a risk to the achievement of the air quality objective.

There are no proposed developments likely to affect SO_2 concentrations, nor are future predicted increases in traffic flow (+2 ppb per 10,000 vehicles AADT) likely to significantly increase SO_2 concentrations.

The air quality objective in those areas remote from City Hospital boiler plant is not likely to be exceeded, and a Third Stage review and assessment is not, therefore, necessary, in such areas.

There is a risk of the air quality objectives' for SO_2 not being met in the vicinity of the City Hospital boiler plant and it is, therefore, necessary to proceed to a Third Stage review and assessment, for this area.

Note:
Exceptional meteorological conditions may occasionally give rise to short lived elevated concentrations of SO_2. In three years of monitoring this occurred once on 2nd September 1998.

14.16 POLLUTANT: CARBON MONOXIDE MONITORING – AUTOMATIC

Nottingham City currently operates 11 Roadside Pollution Monitors (RPM's), a CO analyser located within the Air Quality Mobile Station, and provides Local Site Operators for the DETR AURN station. Their location is detailed in Appendix 11, together with their OS co-ordinates. The DETR AURN equipment is located in a central urban site surrounded by commercial buildings, and in close proximity to roads.

The Air Quality Mobile Station is, as its name suggests, mobile and was located at Dunkirk Fire station during the period 1997 - 1998, and at Sneinton Police Station during the period 1998 - 1999. The Dunkirk site is a suburban mixed industrial/commercial /residential area of the City adjacent to the A52 ring road. The Sneinton Site is a suburban residential area to the east of the City centre.

14.17 DESCRIPTION OF EQUIPMENT

The Roadside Pollution Monitors (RPMs) contain an electro-chemical cell. The gas sensor cell is made up of three layers which generate a voltage proportional to temperature and the concentration of CO.
The automatic monitoring equipment located in the AQMS uses a technique called Non-Dispersive Infra-Red (NDIR). The differences in IR absorption between ambient air and reference gas (air with all CO removed) causes a metallic membrane in the detector to move in accordance with the alternating gas flow and CO concentration.
The DETR AURN station CO analysers use either of two techniques: NDIR described above or Total IR absorption. Total IR absorption uses a filter wheel to allow alternate measurement of total IR absorption, and that due to interfering species in the absorption band selected.
An external carbon monoxide in air calibration cylinder and internal air scrubber are used to provide daily automatic check calibrations.

14.18 POLLUTANT SPECIES MEASURED

The RPMs measure CO concentration indirectly from its reaction within an electro-chemical cell.
The Infrared analysers determine CO concentrations from the absorption of Infrared light by the gas sample.

14.19 POLLUTANT CONCENTRATIONS AND AVERAGING TIMES

The Roadside Pollution Monitors measure CO concentrations over the range 0 to 120 ppm with an averaging time of 5 minutes.

The Infrared analysers measure CO concentrations in ppm over the range 1 to 50 ppm and average the measured concentrations over a 15-minute period.

14.20 MONITORING PERIOD

The AURN station has been operational since October 1996.

The site has a high level of data capture of 97.6% during 1997 and 98.1% during 1998.

The AQMS was commissioned in 1996 at the Dunkirk site and remained there until June 1998, providing approximately 80% data capture during the period 1997-1998. It was then relocated to Sneinton police station where it was operational until September 1999, providing approximately 80% data capture during the period.

14.21 INFORMATION COLLECTED

Information from the AQMS is collected both hourly and daily as 15 minute monitoring periods. The DETR AURN measurements are downloaded periodically to the NETCEN web site in the form of hourly and 15 minute averages.

14.22 ESTIMATION OF ACCURACY AND PRECISION OF RESULTS

Accuracy is defined as 'the closeness of agreement between a single measured value and the actual air quality characteristic or its accepted reference value' (from ISO 6879).

Precision is defined as 'the closeness of agreement between mutually independent test results obtained by repeating a measurement several times under stipulated conditions' (from ISO 6879).

The road side pollution monitors have a manufacturers quoted accuracy of + or – 0.5ppb or 10% whichever is the greater (Siemens). No figure has been provided by Siemens indicating their precision.

The NDIR and IR systems have a quoted accuracy of + or – 10 % and a precision of + or – 1.2 ppb.

14.23 QUALITY CONTROL, MAINTENANCE, CALIBRATION

The DETR AURN CO monitor is subject to a bi-monthly calibration. The calibration is undertaken by suitably trained Local Site Operators and conducted in accordance with the Local Site Operators manual. The equipment is serviced bi-annually. The site is also audited by NETCEN on an annual basis to ensure LSO are conducting the calibrations correctly.

The AQMS CO monitor is subject to a bi-monthly calibration. The calibrations are undertaken by officers trained as LSO's for the DETR AURN and are conducted in accordance with the manufacturer's operating manual. The equipment is serviced six monthly by the equipment supplier or sooner if necessary.

14.24 CALIBRATION GAS TRACEABILITY

Span or calibration gas used in the DETR AURN is supplied by BOC who have demonstrated compliance with relevant quality control procedures in the preparation of gas mixtures and certified by NPL. Span or calibration gases used in the Air Quality Mobile Station are supplied by Messer UK Ltd. Each cylinder is supplied with a certificate of analysis.

14.25 DATA PROCESSING TECHNIQUES

The CO Infra Red analysers measuring cycle takes just a few minutes. The fluctuations in concentration are converted to an output voltage and sent to an Odessa Data Logger. The logger records the voltage variations over time and calculates and records the 15-minute average.

The DETR AURN station's data logger is interrogated on an hourly basis by Stanger Central Management and Co-ordination Unit (CMCU). The data logger records information from all the analysers operating at the site, including the sulphur dioxide analyser.

The data obtained is 'validated' by CMCU and passed to the Data Dissemination Unit (DDU) who compile and disseminate the information

via air quality bulletins. Information from the DETR AURN station is reported as an hourly average concentration.

The City's AQMS data logger is interrogated on an hourly and daily basis by the Siemens Environmental Measurement Database (EMD) v2.63 program. The software scales the collected data with reference to calibration data entered following twice monthly calibration.

The fluctuations in concentrations of the pollutant are subsequently averaged by EMD and displayed as an hourly average. No other data processing techniques are applied.

Data from the RPM's is collected by the Traffic Control Centre's (TCC) computer. The Siemens EMD software interrogates the UTC computer on a daily basis and downloads the previous days 5-minute averages. The data is reported as annual average levels for each site in Tables 2 and 3.

14.26 MODELLING

Where monitoring sites are available within an authority's area, and the location of the sites are representative of the areas of most concern with respect to the exposure of the general public to carbon monoxide, then monitored data can be used in preference to the modelled estimates.

The DETR AURN has been sited in a location considered by Stanger to be a representative Urban Centre location.
The City's Air Quality Mobile Station has been located at two sites. The Dunkirk site was within 15 metres of the A52 trunk road and subject to CO from road traffic, but cannot be considered 'roadside'.
The Sneinton site is a predominantly suburban residential area and therefore representative of other suburban areas within the City.

Although the annual mean for the 11 roadside sites has been calculated from monitored data, it is also necessary to calculate the 8 hour maximum for all roads whose AADT exceeds, or in 2005 are likely to exceed 50000.

Following advice given in the pollutant specific guidance (LAQM.TG4(98) and (00)), the Design Manual for Roads and Bridges methodology and a spreadsheet provided by Stanger were used as a screening model.

Estimated annual average carbon monoxide concentrations for 2005 were in the range 0.25-0.40 ppm. The predicted 8 hr maximum carbon monoxide levels were 2.5 to 4.0 ppm.

14.27 RESULTS

Table 2 details the results from the RPM's, DETR AURN monitor, and the Air Quality Mobile Station.

The monitored CO levels from the automatic Infra red analyser equipment range from 0.2 to 0.6 ppm as a running 8-hour maximum.

Using the methodology of DMRB and spreadsheet supplied by Stanger the predicted roadside levels for 2005 range from 2.5 to 4.0 ppm as an 8-hour maximum.

14.28 CONCLUSION

The monitored and predicted levels are significantly lower than the 2005 air quality objective of 10ppb expressed as the maximum 8-hour mean for both urban background sites and roadside locations.

There are no proposed developments likely to significantly increase CO concentrations, nor are future predicted increases in traffic flow likely to significantly increase CO concentrations.

It is therefore not necessary to proceed to a Third Stage review and assessment.

14.29 BENZENE

It should be noted that there are no standard reference methods currently available for monitoring ambient benzene concentrations.

The reason for conducting a second stage review and assessment is based on the existence of a petroleum transfer and storage station located at Ordnance Survey 462000 340400, Private Road No 3, Netherfield, Gedling.

14.30 SITE DETAILS

Monitoring was undertaken at Private Road No 3, Little Ricketts Lane, Crosslands Meadows and Bourne Mews. These sites form an arc to surround the east, north and west of the site, thus representing typical downwind locations.

14.31 DESCRIPTION OF EQUIPMENT

The monitoring exercise undertaken by Gedling BC involved BTEX Chromosorb 106 80/100 diffusion tubes manufactured by Perkin Elmer. (For consistency with the 1992 National BTX Diffusion Tube Study, it is recommended that Chromosorb 106 is used as the absorbent, with an uptake rate of 1.6 ng ppm-1 min-1 for Perkin Elmer samplers).

The diffusion tubes are exposed to ambient air over a period of two weeks. During this period an agent within the tube adsorbs benzene, toluene, ethylbenzene and xylene (BTEX). At the end of the exposure period the tubes are sealed and sent for analysis.
The exposed tubes are heated to release the adsorbed compounds, in gaseous form. The released gases are passed through a Perkin Elmer 8700 Gas Chromatograph.

14.32 POLLUTANT SPECIES MEASURED

Not specified.

14.33 POLLUTANT CONCENTRATIONS AND AVERAGING TIMES

Results from the BTEX diffusion tubes are quoted in ppb. The averaging time for each period of measurement varies from two to four weeks. See Appendix 4.

14.34 MONITORING PERIOD

Monitoring started in 1996 and the most recent results supplied by Gedling BC are for April 1999.

14.35 INFORMATION COLLECTED

Two weekly and monthly averages of BTEX have been obtained. See Appendix 4.

14.36 ESTIMATION OF ACCURACY AND PRECISION OF RESULTS

The accuracy of the benzene diffusion tube method, as determined by comparison tests, is estimated to be 10% of the measured value (for a Second Stage review and assessment, an overall uncertainty in the measurement techniques of <30% is recommended).

The precision of the method has not been determined.

14.37 QUALITY CONTROL, MAINTENANCE, CALIBRATION

Information regarding this aspect of Gedling Borough Council's monitoring exercise is not available.

14.38 CALIBRATION GAS TRACEABILITY

Not applicable.

14.39 DATA PROCESSING TECHNIQUES

Not applicable.

14.40 RESULTS

Appendix 4 details the results of the BTEX monitoring exercise undertaken by Gedling BC.

It can be seen that both two weekly averaged and monthly averaged levels of benzene are typically less than 1 ppb.
The average of all the monitoring results was 0.69 ppb.
The annual average for 1998 was 0.71 ppb.

14.41 CONCLUSION

The 1998 average annual concentration of 0.71 ppb in the vicinity of the transfer and storage facility is substantially lower than the air quality objective of a 5ppb running annual mean and the proposed air quality objective of 1ppb running annual mean (2005).

There are no proposed developments likely to affect benzene concentrations, nor are future predicted increases in traffic flow likely to significantly increase benzene concentrations.
It is therefore not necessary to proceed to a Third Stage review and assessment.

15 CONSULTATION AND LIAISON

15.1 Local Authorities are required to consult with other agencies, business and the local community. This was achieved by consultation with the agencies detailed in Appendix 14. A press release publicised the exercise and the availability of the document in local libraries and community centres in the Nottingham City area.

15.2 A questionnaire was also distributed with the document to encourage and elicit ideas from the consultees and local community. See Appendix 17.

15.3 Formal responses were received from a number of organisations (Appendix 16). Two responses highlighted aspects of the review and assessment which required amendment or additional supporting information:-

The first related to the characterisation of the Boots Energy Centre combustion plant and Ratcliffe on Soar combustion plant as significant sources of NO_x and SO_2 , respectively. These have now been rated appropriately and the amendments reflected in the revised appendices.

The second related to the methodology used in the Second Stage review and assessment of CO, and the lack of evidence of an assessment of boiler plant with respect to SO2 emissions. In the light of these comments additional screening was carried out as suggested. This supported the findings of the original assessment (see para 14.27); and the chimney height/boiler plant survey undertaken during 1998 has now been referred to (see para 9.8).

One response also made reference to the 'Atmospheric Emission Inventory and Dispersion Modelling Study for Nottinghamshire' and queried the apparent omission of a large solid fuel fired boiler plant from the second stage review and assessment and the results of the modelling study. Further enquiries established that the boiler plants' aggregated thermal power does exceed 5 MWatts. This resulted in the use of a screening model and the decision to proceed to a Stage Three review and assessment (see para 14.16).

The comments received during the consultation process will be considered further once the outcome of the Stage Three review and assessment is known and consideration is given as to how any likely exceedance of the Air Quality objectives may be prevented.

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Appendix 1

Nottinghamshire Part A Prescribed Processes within 50km of Nottingham Centre

Authority Operator	Street	Town	OS Grid X	OS Grid Y	Authori-sation No.	Pollutant	Significant Emission
Nottingham							
Boots the Chemist Plc	Thane Rd	Nottingham	454800	336600	AA3450	CO,NOx	NOx
Boots the Chemist Plc	Thane Rd	Nottingham	454800	336605	AA3450	CO,SO2	SO2
Enviro Energy Ltd	London Rd	Nottingham	457830	339440	AA4715	CO,NOx	NOx
J Mcintyre (Aluminium) Ltd	NMR House Alcester St	Nottingham	455010	337790	AK2866/AX1123	SO2,NOx PM	PM
Yorkshire Environmental Ltd	Eastcroft Incinerator Cattle Market Rd	Nottingham	458205	339124	AH0653	CO,NOx SO2	
Ashfield							
Rolls Royce plc, Fabrication facility	Watnall Rd	Hucknall	452400	347300	AL9050 (variation AP6451)	NOx,HCL HF	
Bassetlaw							
National Power	West Burton Power Station	Near Retford	479100	385700	AA3212	CO,NOx SO2	SO2
National Power	West Burton Power Station	Near Retford	479100	385705	AA3212	CO,NOx, SO2	SO2
Powergen	High Marnham Power Station	Near Retford	480700	371100	AA3425	CO,NOx, SO2	SO2
Powergen	High Marnham Power Station	Near Retford	480700	371105	AA3425	CO,NOx, SO2	SO2
Powergen	Cottam Power Station	Retford	481300	379340	AA3433	CO,NOx SO2	SO2
Powergen	Cottam Power Station	Retford	481300	379345	AA3433	CO,NOx SO2	SO2
Broxtowe							
Knoll Pharmaceuticals	Thane Rd	Beeston	454500	336500	AK6985	VOC	
Knoll Pharmaceuticals	Thane Rd	Beeston	454510	335400	AK7019	VOC	
Knoll Pharmaceuticals	Thane Rd	Beeston	454420	336100	AP6478 (AP 7027)	VOC	
Knoll Pharmaceuticals	Thane Rd	Beeston	454480	336270	AK7035	VOC	

Operator	Street	Town	OS Grid X	OS Grid Y	Authorisation No.	Pollutant	Significant Emission
Newark and Sherwood							
British Sugar	Muskham Rd	Newark	479460	355310	AH9766/AT8592	CO,NOx SO2	
British Sugar	Muskham Rd	Newark	479340	355290	AJ5355	SO2	
British Sugar	Muskham Rd	Newark	479420	355280	AN9766	CO,NOx SO2	
British Sugar	Muskham Rd	Newark	479420	355282	AN9766	CO,NOx SO2	
Coroda Adhesives	Off WinthorpeRd	Newark	480300	355300	AU8440	VOC	
Rushcliffe							
Powergen	Ratcliffe-on-Soar Power Station A453	Ratcliffe-on-Soar	450150	330200	AA2267	CO,NOx SO2	(SO2-prior to FGD)
Powergen	Ratcliffe-on-Soar Power Station A453	Ratcliffe-on-Soar	450150	330205	AA2267	CO,NOx SO2	(SO2-prior to FGD)
Blue Circle Cement	Works Lane	Barnstone	473660	335000	AI0071	PM	
Blue Circle Cement	Works Lane	Barnstone	473660	335005	AI0071	PM	
Blue Circle Cement	Works Lane	Barnstone	473660	335010	AI0071	PM	
WRE Services Ltd	Langar Airfield Industrial Estate	Langar	474000	333000	AX7334	CO,NOx SO2	
Pentex Oil & Gas Ltd	Wymeswold Rd	Rempstone	458180	324040	AF6456	VOC	
Pentex Oil & Gas Ltd	Loughborough Rd	Rempstone	457820	324990	AF6456	VOC	

Additional Part A Processes in Nottinghamshire - by 2005

Operator	Street/Town	OS Grid X	OS Grid Y	Authorisation No.	Process	Pollutant	Significant Emission
Bassetlaw							
Cottam Development Centre	Cottam Power Station	481000	379000	AA3433	3.1 Combustion Process	NOx,CO	
Newark and Sherwood							
British Sugar	Muskham Road, Newark	479550	355220	B50	3.1 Combustion Process	NOx	
British Sugar	Muskham Road, Newark	479550	355221	B50	3.1 Combustion Process	VOC	
British Sugar	Muskham Road, Newark	479550	355222	B50	3.1 Combustion Process	VOC	

Appendix 1a

Nottingham City Part B Prescribed Processes

Operator	Street	OS Grid X	OS Grid Y	Authorisation No.	Pollutant	Significant Emission
Kelley Commercial Vehicles	37-55 The Wells Rd	458567	341349	1.35.112	SO2,PM	
Grove Garage	First Avenue, Greasley St	453671	345098	1.35.106	SO2,PM	
Bill Parker	rear of 178 Wollaton Rd, Wollaton	454270	340082	1.35.107	SO2,PM	
Filtrauto	Glaisdale Drive, Bilbrough	452100	340670	6.50.311	NOx, CO	
Thomas Fish & Sons Ltd	Little Tennis St	458996	338951	6.50.206	VOC	
TDG Harris	Willow Rd, Lenton	455329	338514	6.50.114	VOC	
Silverline Coachworks	Ilkeston Rd	454980	340406	6.50.118	VOC	
Evans Halshaw	Ilkeston Rd	454904	340196	6.50.106	VOC	
Hooleys Garage	Abbey St Lenton	455074	338729	6.50.107	VOC	
Hooleys Garage	Abbey St Lenton	455134	339444	6.50.108	VOC	
Redland Aggregates	Harrimans Lane	455131	337775	3.10.105	PM	
Nottingham Mini Mixed Concrete	Moorbridge Works, Bestwood Rd	454798	346718	3.10.103	PM	
Conflow Ltd	Triumph Rd, Lenton	454855	339587	2.20.102	PM,VOC	
Sturmey Archer Ltd	Triumph Rd, Lenton	454709	339603	2.20.101	PM,VOC	
Nottingham City Council	Harvey Rd, Bilborough	452885	341568	6.70.106	VOC	
Mill Garage	45 Nuthall Rd	454815	341635		SO2,PM	
Bridgeway Garage Services	122A Hucknall Lane	454380	345923	1.35.105	SO2,PM	
Wrights & Dobson Ltd	107 Carlton Rd	458439	340281	1.3L.101	SO2,PM	
Nottingham City Hospital NHS Trust	Estates Dept-Hucknall Rd	457015	344126	5.1A.103	NOx	
Cowies Ford Nottingham	London Rd	454975	339278	6.50.105	PM,VOC	
New Crown Motor Sales Ltd	Cinderhill Rd	453976	344449	6.50.110	PM,VOC	
Blackburn Starling & Co Ltd	Queens Dr	456398	338019	6.50.301	PM,VOC	
Stag Furniture Ltd	Haydn Rd, Sherwood	456190	342860	6.70.108	PM,VOC	

Stag Furniture Ltd	Haydn Rd, Sherwood	456190	342861	6.70.108	PM	
Manson Timber Ltd	165 Loughborough Rd, Ruddington	459104	339160	6.70.103	VOC	
Peatman & Cox	8 Bennerley Court, Bulwell	452887	345981	1.35.102	SO2,PM	
J Howitt & Son	Bennerley Rd	452769	345746	6.50.402	VOC	
Ready Mixed Concrete Ltd	Radford Rd	455522	342283	3.10.104	PM	
Selbys	Lortas Rd, Basford	455947	342647	6.50.112	VOC	
Bampton Packaging Ltd	Lenton Lane	455489	338179		PM	
A.N Wallis & Co Ltd	Greasley St	453497	345002	2.20.103	PM,VOC	
Vic Fearn & Co Ltd	Crabtree Mill, Hempshill Lane	453347	344716	6.70.107	PM	
Vic Fearn & Co Ltd	Crabtree Mill, Hempshill Lane	453347	344716	6.50.202	VOC	
A1 Mini-Mix Ltd	Plot 8, Moorbridge Works, Bestwood Rd	454808	346739	3.10.106/1	PM	
R.H Commercial Vehicles Ltd	Lenton Lane	455802	337861	6.50.115	VOC	
Nixon Knowles	Longsall Ave	456128	338095	6.70.112	PM	
Lafarge Redland	Little Tennis St	459290	339050	3.10.102	PM	
Fitchett & Wollacott	Lenton Lane	455530	338610	6.70.102	PM	
Universal Engineering	Radford Rd, Basford	455533	342137	2.20.105	PM	
Hill & Tyler	Glaisdale Dr Bilborough	452334	340745	6.50.405	VOC	
BPC Nottingham Ltd	Wigman Rd Aspley	453154	340647	6.50.401/1	VOC	
G & S Carplus	398A Alfreton Rd	455280	341100	1.35.108	SO2,PM	
FH Saunderson	Radford Rd Basford	455614	342298	1.35.101	SO2,PM	
Moore & Company	Haydn Rd	456312	342668	6.50.403	VOC	
Imperial Tobacco Ltd	Thane Rd	455391	337167	6.90.101/1	PM	
Reg Vardy	Castle Bridge Rd	456490	338930	6.50.113	VOC	
Castle Concrete Ltd	Castle Meadow Rd	456792	339104	3.10.101	PM	
Skills Motor Coaches	St Peters St Radford	455138	340343	1.35.114	SO2,PM	
T C Autos	Salisbury Sq. Radford	455298	339928	1.35.115	SO2,PM	
Bell Fruit Manufacturing	Leen Gate Lenton	455036	338844	6.70.109	PM	

Timber Tailors (ZAF) Plc	Belgrave Rd Bulwell	453466	345298	6.70.110	PM	
Timber Tailors (ZAF) Plc	Ilkeston Rd Radford	455729	340262	6.70.111	PM	
W J Furse & Co Ltd	Wilford Rd Meadows	456943	338879	2.20.106	PM	
W J Furse & Co Ltd	Wilford Rd Meadows	456943	338879	2.20.107	PM	
Lafarge Redland Ennemix 2	Little Tennis St Sneinton	459300	339059	3.10.102/1	PM	
Beasley Coated Stone (Tilcon)	Little Tennis St Sneinton	459465	339180	3.40.101	PM	
Toton Plant Hire		Mobile	mobile	3.40.102	PM	
Leverton Environmental		Mobile	mobile	3.40.103	PM	
Colwick Vale Coachworks	Colwick Road Sneinton	459658	339609	6.50.104	VOC	
Mann Egerton Co Ltd	Derby Rd	455137	339442	6.50.109	VOC	
Ransbrook Automobile Eng. Ltd	Freeth St Meadow Lane	458483	338814	6.50.111	VOC	
Nottingham Godfrey Davis	Lenton Lane	455998	337319	6.50.117	VOC	
TDG Harris	Willow Rd Lenton	455329	338514	6.50.114	VOC	
Timber Tailors (ZAF) Plc	Belgrave Rd Bulwell	453466	345298	6.50.203	VOC	
Timber Tailors (ZAF) Plc	Ilkeston Rd Radford	455729	340262	6.50.204	VOC	
Sturmey Archer Ltd	Triumph Rd Lenton	454710	339603	6.50.206	VOC	
Sawford Sheet Metal	Dunkirk Rd Dunkirk	455168	338480	6.50.308	VOC	
Beechdale Engineering Ltd	Dabell Ave Blenheim Ind.Est.	452117	345874	6.50.309	VOC	
Raleigh Industries Ltd	Triumph Rd Lenton	455038	339643	6.50.304	VOC	
A R Wilson Packaging Ltd	Nottingham Rd Basford	455137	343003	6.50.404	VOC	
Hawthornes of Nottingham Ltd	Palm St New Basford	455947	341931	6.50.406	VOC	

Boiler Plant exceeding 5MWatts

Nottingham City Hospital	Hucknall Road	457015	344126		SO2,PM	SO2

Appendix 1b

Nottinghamshire Part B Prescribed Processes within 10km of Nottingham

Authority Operator	Street	Town	OS Grid X	OS Grid Y	Authorisation No	Pollutant	Significant Emission
Ashfield							
J & E Shearman	Derby Rd	Kirkby in Ashfield	451920	355820	1.03.3		
Dale Auto Repairs	Urban Rd	Kirkby in Ashfield	450260	356170	1.03.38		
Annesley/Bentinck Colliery Ltd	Park Lane	Kirkby in Ashfield	448800	355050	3.04.15	PM	
RJ Budge Mining Ltd (UK)	Birchwood Lane	Somercotes, Alfreton	444500	353500	3.04.7	PM	
Redland Ready Mix Ltd	Junction Rd	Sutton in Ashfield	451085	358570	3.01.8		
Tarmac Topmix Ltd	Lowmoor Rd	Kirkby in Ashfield	450680	356560	3.01.11		
Tarmac Precast Concrete Ltd	Southwell Lane	Kirkby in Ashfield	450100	357090	3.01.4		
Manor Baits	Whyburn Lane	Hucknall	451310	350110	6.09.2		
ARC Central	Wigwam Lane	Hucknall	454380	348820	3.01.5		
Central Garage	Portland Rd	Hucknall	453800	348900	6.05.41		
Doorvale Ltd	Portland Ind Est, Southwell Lane	Kirkby-in-Ashfield	450300	356300	6.05.46		
Doorvale Ltd	Portland Ind Est, Southwell Lane	Kirkby-in-Ashfield	450300	356805	6.07.45		
Rolls Royce Plc	Watnall Rd	Hucknall	452400	347300	6.05.30		
Ameron Coatings	Blackwell Road, Huthwaite	Sutton-in-Ashfield	446550	359100	6.06.14		
Ashfield Extrusion Ltd	Clover St	Kirkby in Ashfield	450435	356515			
Stag Merenew Furniture Ltd	Park Drive	Hucknall	453380	348380	6.07.1		
Stag Merenew Furniture Ltd	Park Drive	Hucknall	453380	348380	6.05.29		
Broxtowe							
Havelock Europe	Church St	Eastwood	444810	334830	22/92		

Sinbad Plant	Hickings Le	Stapleford	444980	333830	'2/91		
N K Motors	389 High Rd	Chilwell	445130	333530	'8/91		
Coldi Motors	Ellis Grove	Beeston	445260	333640	'1/91		
Yeomans Meat	Brookhill Leys Rd	Eastwood	444650	334600	15/92		
Fernwood Fuels Ltd	Main Rd	Watnall	445080	334540	'14/92	PM	
RMC Mortars	Coventry Lane	Bramcote	445020	333880	'13/92		
Windsor Garage Ltd	Ellis Grove	Beeston	454260	333640	'12/92		
Ready Mixed Concrete (UK) Ltd	Long Lane	Attenborough	445210	333500	'9/91		
Bramcote Crematorium	Coventry Lane	Bramcote	445010	333900	'3/91		
Sandicliffe Garages	Nottingham Rd	Stapleford	444920	333730	'18/92		
Magna Seating Systems	Newmanleys Rd	Eastwood	444660	334580	'19/92		
Caunton Engineering Ltd	Moorgreen Industrial Estate	Moorgreen	444770	334790	'21/92		
DKH Coachworks	Cosall Industrial Estate	Cossall	444770	334250	'4/95		
Havelock Europe	Church St	Eastwood	444810	334830	'6/91		
P P Payne	Giltway	Giltbrook	444800	334530	'20/92		
Havelock Europe	Church St	Eastwood	444610	334630	'6/91		
Securicor Vehicle Services Ltd	Giltway	Giltbrook	444820	334550	'1/96		
Long Eaton	Attenborough Pit	Thrumpton	450500	332500		PM	
Gedling							
Joy Mining Machinery	Park Rd	Bestwood Village	455040	347330	LL/6.5/94		
J Rann Coach Builders	Arnot Hill Rd	Arnold	458470	345210	JR/6.5/95		
Chettle Ltd	Stoke Lane	Stoke Bardolph	463820	341710	CH/6.9/92		
Tarmac Heavy building Materials	Private Road No 5, Colwick Ind Est	Colwick	462550	340450			
Ibstock Brick Co	Dorket Head	Arnold	459250	347450	MB/3.6/91		
THOS.W.WARD	Private Road No4 Colwick Ind Est	Colwick	463130	340060	TW/3.4/92		SO2,PM
Tilcon Ltd	Park Rd	Bestwood Village	456200	347980	TM/3.1/92		

RJB (Deep Mines) Ltd	Calverton Colliery	Calverton	460300	350160	CC/3.4/92		PM
Vale Motors	782 Mansfield Rd	Woodthorpe	457960	344490	VM/1.3/91		
Lawrence Automotive Ltd	Pintail Close	Netherfield	462740	340510	LA/6.5/96		
Gas Container Services	Private Rd No7 Colwick Ind Est	Colwick	461970	340610	GS/6.5/92		
Trent Concrete	Private Rd No3 Colwick Ind Est	Colwick	462860	340230	TC/3.1/92		
Gibson Lea Ltd	Private Rd No 2 Colwick Ind Est	Colwick	461800	340280	PS/6.5/92		
Gibson Lea Ltd	Private Rd No 2 Colwick Ind Est	Colwick	461800	340280	PM/6.7/91		
Atlas House	Private Road No 1 Colwick Ind Est	Colwick	461760	340620	AH/6.5/93		
Tractor Services	Shelt Hill	Woodborough	464030	348340	TS/1.3/92		
NCC Central Workshops	Rolleston Drive	Arnold	459440	345490	NCCCW/ 6.5/95		
Brookside Garage	10 Mansfield Lane	Calverton	461690	349780	BG/1.3/93		
Hammonds of Daybrook	199 Mansfield Rd	Daybrook	457790	345400	MD/6.5/92		
M R Refinishing	Private Rd No 4	Colwick	463280	339940	MR/6.5/95		
Eurobait Ltd	Private Rd No 4	Colwick	463400	339850	EB/6.9/91		
Wheldons Garage	301 Carton Hill	Carlton	460070	341330	WG/1.3/9 1		
Luxfer UK Ltd	Private Rd No2	Colwick	461920	340220	LX/6.5/92		
Elite Readymix Ltd	New Rd Private Rd No 4	Colwick	463170	349980	ER/3.1/94		
Masons Ltd	Private Rd No 8	Colwick	461670	340490	MS/6.7/91		
Sytners of Nottingham	Burgass Rd	Carlton	459560	341400	JC/6.5/92		
Tarmac Heavy Building Materials	Bestwood Quarry, Devil's Elbow	Papplewick Netherfield	456760	352680		PM	
Newark and Sherwood							
Ashbourne Motors	Gunthorpe		467680	344530	B66		
T C Morley	Main St	Lowdham	467040	346330	B16		
Yates Agricultural	Station Yard	Thurgarton	468440	347080	B17		
John Harrison Ltd	Southwell Rd, Lowdham	Nottingham	467500	346576	B59		

Westpile Ltd	Thurgarton Lane	Hoveringham	469900	348000	B46/2		
Marshalls Flooring Ltd	Thurgarton Lane	Nottingham	470000	348400	B41/2		
Ingersoll Dresser Pumps	Hawton Lane	Newark	480700	351100	B40		
Rushcliffe							
Barrys Autos	Candlebury Lane	Cotgrave	464750	335300	EPA/92/001	SO2,PM	
Radcliffe Garage	Bingham Rd	Radcliffe-on-Trent	464810	339300	EPA/92/005	SO2,PM	
J & E Greenacres	Radcliffe Rd	Gamston	460450	337040	EPA/92/003	SO2,PM	
Black Star Motors	Blake Rd	West Bridgford	459050	337300	EPA/92/002	SO2,PM	
Jack F Hopewell	Edward Rd	West Bridgford	458630	338120	EPA/92/007	VOC	
WA Hatfield	Rectory Rd	West Bridgford	458540	337230		VOC	
John Fox Ltd	Loughbo - rough Rd	West Bridgford	458060	336670		VOC	
University of Nottingham	College Rd	Sutton Bonington	450450	326350	EPA/95/006	NOx	
MAFF	College Rd	Sutton Bonington	450420	326170	EPA/92/010	NOx	
Nottingham City Council	Loughbo-rough Rd	West Bridgford	457850	335100	EPA/92/006	NOx	
Tarmac Heavy building Materials	Holme Lane	Holme Pierrepont	461800	338900	EPA/93/012	PM	
Ibstock Brick Co	Rempstone Rd	Normanton-on-Soar	451400	324150	EPA/92/009	NOx	
Catensa (UK) Limited	Harby Rd	Langar	473450	332800	EPA/94 015a	VOC	
Powergen	Winking Hill	Ratcliffe-on-Soar	450500	329050	EPA/95/005	SO2	
British Gypsum	Gotham Rd	East Leake	455400	328000	EPA/95/001	PM	
British Gypsum	Gotham Rd	East Leake	455400	328005	EPA/95/001	PM	
Nottingham By-Products Ltd	Langar Industrial Estate	Langar	473730	334030	EPA/95/002		

Additional part B Processes operating in 2005

Operator	Street	Town	OS Grid X	OS Grid Y	Authoris - ation No.	Pollutant	Significant Emission
RTS	Harby Rd	Langar	473770	334000	Applying	VOC	
CMS Processes Ltd	Coach Gap Lane	Langar	473230	334320	Applying	PM	
Lindley Plant Ltd	off A610	Newthorpe	447200	343900	`10/92	PM	

T.C. Autos	Unit 6 Salisbury Sq, Radford	Nottingham	455298	339928	1.35.115	SO2,NOx	
Sawford Sheet Metal Ltd	Dunkirk Rd	Dunkirk	455168	338480	6.50.308	VOC	
Tilcon (South) Ltd	Welshcroft Close, Southwell Le	Kirkby-in-Ashfield	450330	357100	3.04.50	PM	
Teepee Reclamations	Wigwam Lane	Hucknall	454800	348400		PM	
RJB Mining (UK) Ltd			461000	343000		PM	
Texaco/Total Oil	Colwick Industrial Estate		462000	340000		VOC	Benzene
RJB Mining (UK) Ltd	Shortwood Farm/Cossall Rd	Trowell	449000	341000		PM	

Appendix 1c : Road Links with Present and Projected Average Daily Traffic Flow > 20,000

ROAD NUMBER	Road Section	AADT 1997	AADT 2005	Pollutant
M1	MI J28 (A38) - J27 (A608)	94250	102356	NOx, CO, PM10
M1	M1 J27 (A608) - J26 (A610)	95500	103713	NOx, CO, PM10
M1	M1 J26 (A610) - J25 (A52)	100550	109197	NOx, CO, PM10
M1	M1 J25 (A52) - J24 (A453)	112000	121632	NOx, CO, PM10
A52(T)	Derby Road, Nottingham:A52 Bypass (Bramcote Island) - Thoresby Road	49150	53377	NOx, CO, PM10
A52(T)	Derby Road, Nottingham:Thoresby Road - B6006 Wollaton Road	46950	50988	NOx, CO, PM10
A52(T)	Derby Road, Nottingham: B6006 Wollaton Road - A6464 Woodside Road	47650	51748	NOx, CO, PM10
A52(T)	Derby Road, Nottingham: A6464 Woodside Road - A6514 Clifton Boulevard	44300	48110	NOx, PM10
A52(T)	Clifton Boulevard, Nottingham: A52 Derby Road - A6005 (Dunkirk Flyover)	64000	69504	NOx, CO, PM10
A52(T)	Clifton Boulevard, Nottingham: A6005 (Dunkirk Flyover) - A453 Queens Drive	73000	79278	NOx, CO, PM10
A52(T)	Clifton Bridge, Nottingham: A453 Queens Drive - A453 Clifton Lane	79950	86826	NOx, CO, PM10
A52(T)	Clifton Boulevard, Nottingham: A453 Clifton Lane - A60(Nottingham Knight Roundabout)	42500	46155	NOx, PM10
A60	Mansfield Road, Sherwood:Thackerays Lane - Valley Road	45650	49576	NOx, PM10
A60	Mansfield Road, Sherwood: Valley Road - Woodthorpe Drive	24650	26770	NOx, PM10
A60	Mansfield Road, Sherwood: Woodthorpe Drive - Edwards Lane	25300	27476	NOx, PM10
A60	Mansfield Road, Sherwood: Edwards Lane - Winchester Street	27950	30354	NOx, PM10
A60	Mansfield Road, Sherwood: Winchester Street - Haydn Road	26300	28562	NOx, PM10
A60	Mansfield Road, Carrington: Haydn Road - A611 Hucknall Road	22250	24164	NOx
A60	Mansfield Road, Carrington: A611 Hucknall Road - A6130 Gregory Boulevard	35850	38933	NOx, PM10
A60	Mansfield Road, Nottingham: A6130 Gregory Boulevard - Forest Road East	40050	43494	NOx, PM10
A60	Mansfield Road, Nottingham: Forest Road East - Huntingdon Street	38500	41811	NOx, PM10
A60	Huntingdon Street, Nottingham: Mansfield Road - B684 Woodborough Road	19950	21666	NOx
A60	Huntingdon Street, Nottingham: B684 Woodborough Road - Glasshouse Street	27100	29431	NOx, PM10
A60	Huntingdon Street, Nottingham: King Edward Street - A6008 Lower Parliament Street	26450	28725	NOx, PM10
A60	Mansfield Road, Nottingham: Huntingdon Street - B684 Woodborough Road	18850	20471	NOx
A60	Mansfield Road, Nottingham: B684 Woodborough Road - Shakespeare Street	19550	21231	NOx
A60	Milton Street, Nottingham: Shakespeare Street - A6008 Trinity Square	19000	20634	NOx
A60	London Road, Nottingham: Canal Street - Station Street	50200	54517	NOx, CO, PM10
A60	London Road, Nottingham: Station Street - A6008 Queens Road	42950	46644	NOx, PM10

A60	London Road, Nottingham: A6008 Queens Road - Crocus Street	44250	48056	NOx, PM10
A60	London Road, Nottingham: Crocus Street - A6011 Cattle Market Road	46900	50933	NOx, CO, PM10
A60	London Road, Nottingham: A6011 Cattle Market Road - B685 Meadow Lane	34600	37576	NOx, PM10
A60	Trent Bridge, Nottingham: B685 Meadow Lane - A6520 Radcliffe Road	49850	54137	NOx, CO, PM10
A453(T)	Kegworth Road, Ratcliffe on Soar - C4 Clifton Lane(Crusader Roundabout)	21600	23458	NOx
A453(T)	Clifton Lane, Clifton: C4(Crusader Roundabout) - Green Lane	28900	31385	NOx, PM10
A453(T)	Clifton Lane, Clifton: Green Lane - Farnborough Road	29700	32254	NOx, PM10
A453(T)	Clifton Lane, Clifton: Farnborough Road - A52(Silverdale Roundabout)	52000	56472	NOx, CO, PM10
A453(T)	Clifton Lane, Silverdale: A52(Silverdale Roundabout) - Clifton Boulevard	48300	52454	NOx, CO, PM10
A453	Queens Drive, Nottingham: A52 Clifton Boulevard - Tottle Road	35350	38390	NOx, PM10
A453	Queens Drive, Nottingham: Tottle Road - Riverside Way	36250	39368	NOx, PM10
A453	Queens Drive, Nottingham: Riverside Way - Crossgate Drive	27100	29431	NOx, PM10
A453	Queens Drive, Nottingham: Crossgate Drive - Castle Bridge Road	29350	31874	NOx, PM10
A453	Queens Drive, Nottingham: Castle Bridge Road - Waterway Street West	28550	31005	NOx, PM10
A609	Wollaton Road, Wollaton: Russell Drive to A6514 (Crown Island)	22650	24598	NOx
A609	Wollaton Road, Nottingham: A6514 (Crown Island) - Triumph Road	22600	24544	NOx
A609	Ilkeston Road, Nottingham: Triumph Road - A6130 Lenton Boulevard	22600	24544	NOx
A610	A610 By Pass, Nottingham: M1 J26 - Low Wood Road (Nuthall Roundabout)	45300	49196	NOx, PM10
A610	A610 By Pass, Nottingham: Low Wood Road (Nuthall Roundabout) - B6008 Bells Lane	39750	43169	NOx, PM10
A610	Nuthall Road, Cinderhill: B6008 Bells Lane - B6004 Stockhill Lane	42800	46481	NOx, PM10
A610	Nuthall Road, Nottingham: B6004 Stockhill Lane - Melbourne Road	31550	34263	NOx, PM10
A610	Nuthall Road, Nottingham: Melbourne Road - A6514 Western Boulevard	36200	39313	NOx, PM10
A610	Nuthall Road, Nottingham: A6514 Western Boulevard - B690 Aspley Lane	24450	26553	NOx, PM10
A610	Bobbers Mill Bridge, Nottingham: B690 Aspley Lane - A6130 Gregory Boulevard	33750	36653	NOx, PM10
A610	Alfreton Road, Nottingham: Bentinck Road - Forest Road West	23150	25141	NOx, PM10
A610	Alfreton Road, Nottingham: Forest Road West - Canning Circus	22750	24707	NOx
A610	Canning Circus(inbound), Nottingham: Alfreton Road - Talbot Street	24600	26716	NOx, PM10
A610	Wollaton Street, Nottingham: Canning Circus - Toll House Hill	20700	22480	NOx
A611	Hucknall Lane,Bulwell: Hucknall Bypass - Moor Bridge	28250	30680	NOx, PM10
A611	Moor Bridge, Bulwell: A6002 Hucknall Lane - B683 Bestwood Road	26350	28616	NOx, PM10
A611	Hucknall Road, Bulwell: B683 Bestwood Road - Bestwood Park Drive	27800	30191	NOx, PM10
A611	Hucknall Road, Nottingham: Bestwood Park Drive - Top Valley Way	20300	22046	NOx
A611	Hucknall Road, Nottingham: Top Valley Way - Kersall Drive	21600	23458	NOx

A611	Hucknall Road, Nottingham: Kersall Drive - B6004 Arnold Road	21150	22969	NOx
A611	Hucknall Road, Nottingham:B6004 Arnold Road - Heathfield Road	19850	21557	NOx
A611	Hucknall Road, Nottingham: Heathfield Road - A6514 Valley Road	23650	25684	NOx, PM10
A612	Pennyfoot Street, Nottingham: A6008 Lower Parliament Street - Manvers Street	19700	21394	NOx
A612	Manvers Street, Nottingham: Pennyfoot Street - Sneinton Hermitage	20000	21720	NOx
A612	Manvers Street, Nottingham: Sneinton Hermitage - A6011 Meadow Lane	20000	21720	NOx
A612	Daleside Road, Nottingham: A6011 Meadow Lane - Trent Lane	29200	31711	NOx, PM10
A612	Daleside Road, Nottingham: Trent Lane - Racecourse Road	25200	27367	NOx, PM10
A612	Daleside Road East, Nottingham: Racecourse Road - Vale Road	23700	25738	NOx, PM10
A6002	Hucknall Lane, Bulwell: A611 Moor Bridge - Sandhurst Road	30200	32797	NOx, PM10
A6002	Low Wood Road, Bulwell: Sellers Wood Drive - A610(Nuthall Roundabout)	18650	20254	NOx
A6002	Woodhouse Road, Broxtowe: A610(Nuthall Roundabout) - B6004 Strelley Road	22000	23892	NOx
A6002	Bilborough Road, Strelley: B6004 Strelley Road - A609 Balloon Woods (junction)	22350	24272	NOx
A6005	Queens Road West, B6006 Station Road - A6005 Bye Pass Road	21000	22806	NOx
A6005	Queens Road , Nottingham: A6005 Beacon Road - A6006 Station Road	23650	25684	NOx, PM10
A6005	Queens Road East, Nottingham: A6005 University Boulevard - Beacon Road	31800	34535	NOx, PM10
A6005	University Boulevard, Nottingham: Queens Road East - University Access	41800	45395	NOx, PM10
A6005	Beeston Road, Nottingham: University Access - A52 (Dunkirk Flyover)	43400	47132	NOx, PM10
A6005	Abbey Street, Nottingham: A52 (Dunkirk Flyover) - Gregory Street	26550	28833	NOx, PM10
A6005	Abbey Bridge, Nottingham: Gregory Street - Castle Boulevard	23550	25575	NOx, PM10
A6005	Castle Boulevard, Nottingham: Abbey Bridge - Castle Bridge Road	34950	37956	NOx, PM10
A6005	Castle Boulevard, Nottingham: Castle Bridge Road - A6008 Wilford Street	25100	27259	NOx, PM10
A6008	Lower Parliament Street, Nottingham: A60 Glasshouse Street - Cranbrook Street	24850	26987	NOx, PM10
A6008	Lower Parliament Street, Nottingham: A60 Huntingdon Street - Hockley	21900	23783	Nox
A6008	Lower Parliament Street, Nottingham: Hockley - A612 Southwell Road	28450	30897	NOx, PM10
A6008	Lower Parliament Street, Nottingham: A612 Southwell Road - A612 Pennyfoot Street	24500	26607	NOx, PM10
A6008	Lower Parliament Street, Nottingham: A612 Pennyfoot Street - A60 London Road	28500	30951	NOx, PM10
A6008	Plumptre Square, Nottingham: A60 London Road - A612 Fisher Gate	30650	33286	NOx, PM10
A6008	Bellar Gate/Hollowstone, Nottingham: A612 Fisher Gate - Barker Gate	22350	24272	NOx
A6008	Belward Street, Nottingham: Barker Gate - Hockley	28250	30680	NOx, PM10
A6008	Cranbrook Street, Nottingham: Hockley - Lower Parliament Street	23300	25304	NOx, PM10
A6008""	Canal Street, Nottingham: A60 London Road - Collin Street	40300	43766	NOx, PM10
A6008	Canal Street, Nottingham: Collin Street - Carrington Street	32650	35458	NOx, PM10

A6008	Canal Street, Nottingham: Carrington Street - Greyfriar Gate	33250	36110	NOx, PM10
A6008	Greyfriar Gate, Nottingham: Canal Street - Collin Street	27400	29756	NOx, PM10
A6008	Maid Marian Way, Nottingham: People's College - Greyfriar Gate	29600	32146	NOx, PM10
A6008	Collin Street, Nottingham: Greyfriar Gate - Middle Hill	37000	40182	NOx, PM10
A6008	Collin Street, Nottingham: Middle Hill - Canal Street	32850	35675	NOx, PM10
A6008	Maid Marian Way, Nottingham: People's College - Friar Lane	34950	37956	NOx, PM10
A6008	Maid Marian Way, Nottingham: Friar Lane - Upper Parliament Street	31900	34643	NOx, PM10
A6008	Upper Parliament Street, Nottingham: A6200 Derby Road - A610 Wollaton Street	21050	22860	NOx
A6008	Milton Street, Nottingham: Trinity Square - Upper Parliament Street	22650	24598	NOx
A6008	Burton Street\Trinity Square, Nottingham: South Sherwood Street - A60 Milton Street	19050	20688	NOx
A6008	South Sherwood Street, Nottingham: Burton Street - Upper Parliament Street	24650	26770	NOx, PM10
A6008	Lower Parliament Street, Nottingham: Milton Street - A60 Glasshouse Street	24250	26336	NOx, PM10
A6011	Meadow Lane, Nottingham: Lady Bay Bridge - A612 Daleside Road	29600	32146	NOx, PM10
A6011	Lady Bay Bridge, Nottingham: Meadow Lane - Radcliffe Road	20150	21883	NOx
A6130	Gregory Boulevard, Nottingham: A60 Mansfield Road - B682 Sherwood Rise	25950	28182	NOx, PM10
A6130	Gregory Boulevard, Nottingham: B682 Sherwood Rise - Noel Street	21650	23512	NOx
A6130	Gregory Boulevard, Nottingham: Radford Road - A610 Alfreton Road	19700	21394	NOx
A6130	Lenton Boulevard, Nottingham: A609 Ilkeston Road - A6200 Derby Road	20300	22046	NOx
A6200	Derby Road, Nottingham: A52 Clifton Boulevard - Gregory Street	27850	30245	NOx, PM10
A6200	Derby Road, Nottingham: Gregory Street - A6130 Lenton Boulevard	33300	36164	NOx, PM10
A6200	Derby Road, Nottingham: A6130 Lenton Boulevard - Canning Circus	22900	24869	NOx
A6200	Derby Road, Nottingham: A6008 Maid Marian Way - Canning Circus	18950	20580	NOx
A6464	Woodside Road,Beeston: A52 Derby Road - B6464 Broadgate	18750	20363	NOx
A6464	University Boulevard, Beeston: B6464 Broadgate - A6005 Queens Road East	21600	23458	NOx
A6514(T)	Valley Road, Sherwood: A60 Mansfield Road - Edwards Lane	25000	27150	NOx, PM10
A6514(T)	Valley Road, Sherwood: Edwards Lane - A611 Hucknall Road	30550	33177	NOx, PM10
A6514(T)	Valley Road, Basford: A611 Hucknall Road - B682 Nottingham Road	32350	35132	NOx, PM10
A6514(T)	Valley Road, Basford: B682 Nottingham Road - B682 Vernon Road	40800	44309	NOx, PM10
A6514(T)	Western Boulevard, Nottingham: B682 Vernon Road - A610 Nuthall Road	35650	38716	NOx, PM10
A6514(T)	Western Boulevard, Nottingham: A610 Nuthall Road - B690 Aspley Lane	43100	46807	NOx, PM10
A6514(T)	Western Boulevard, Nottingham: B690 Aspley Lane - Beechdale Road	46600	50608	NOx, CO, PM10
A6514(T)	Western Boulevard, Nottingham: Beechdale Road - A609(Crown Island)	51950	56418	NOx, CO, PM10
A6514(T)	Middleton Boulevard, Wollaton: A609(Crown Island) - A52 Derby Road	50350	54680	NOx, CO, PM10

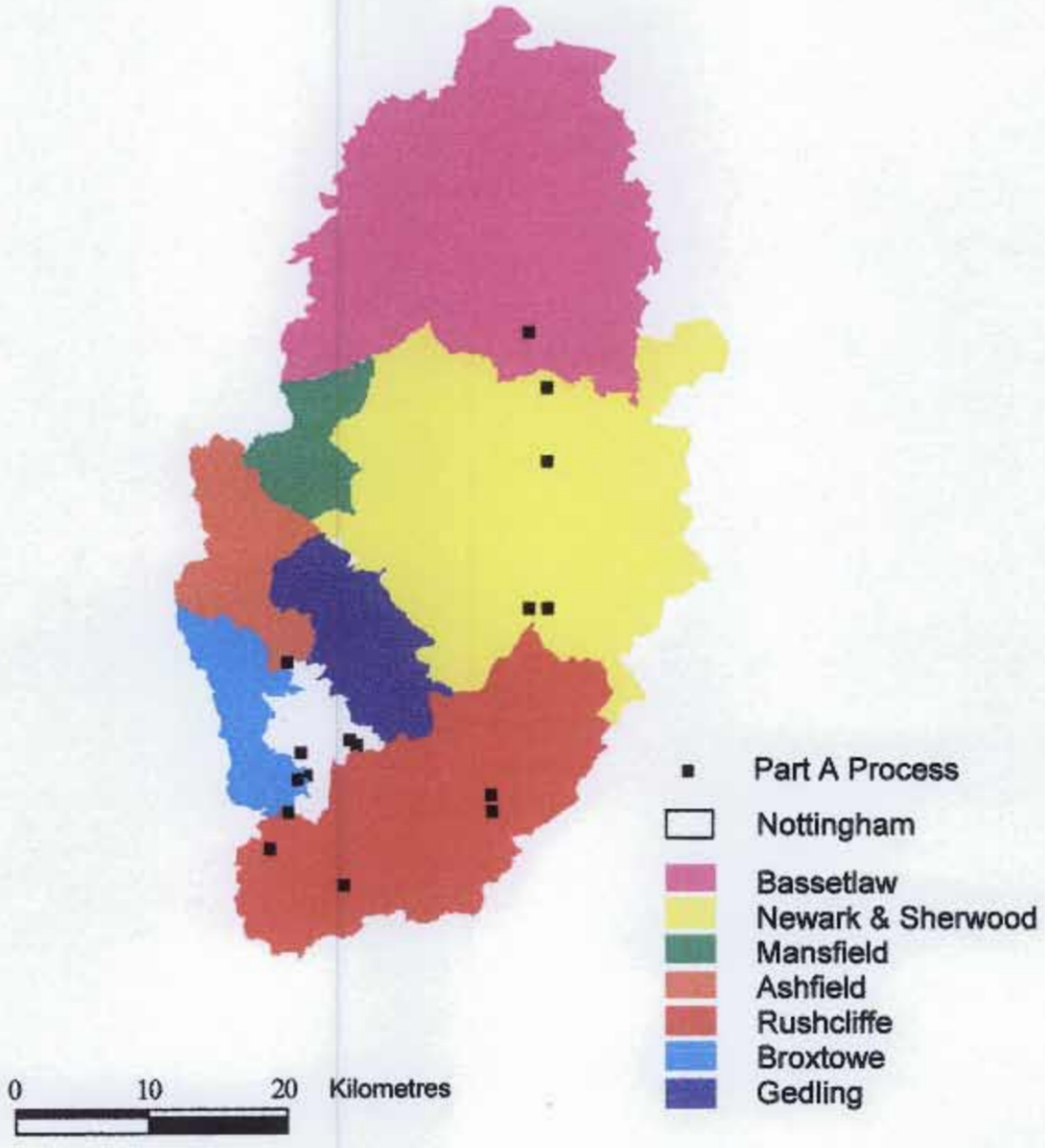
B684	Plains Road, Woodthorpe: Arnold Lane - Westdale Lane	20100	21829	NOx
B684	Plains Road, Woodthorpe: Westdale Lane - Woodthorpe Drive	20500	22263	NOx
B684	Woodborough Road, Mapperley: Woodthorpe Drive - Porchester Road	28550	31005	NOx, PM10
B684	Woodborough Road, Mapperley : Porchester Road - The Wells Road	26000	28236	NOx, PM10
B686	Carlton Road, Sneinton: A612 Manvers Street - Bath Street	25190	27356	NOx, PM10
B686	Carlton Road, Sneinton: A612 Bath Street - Porchester Road	27802	30193	NOx, PM10

NOTES

1. HGV(Heavy Goods Vehicles) include all commercial vehicles over 1.5 tonnes unladen weight
2. " now classified A6008
3. "" now classified unnumbered
4. Forecast 2005 flows - All vehicles * 1.086 (National Road Traffic Forecasts 1997 – Urban Trunk

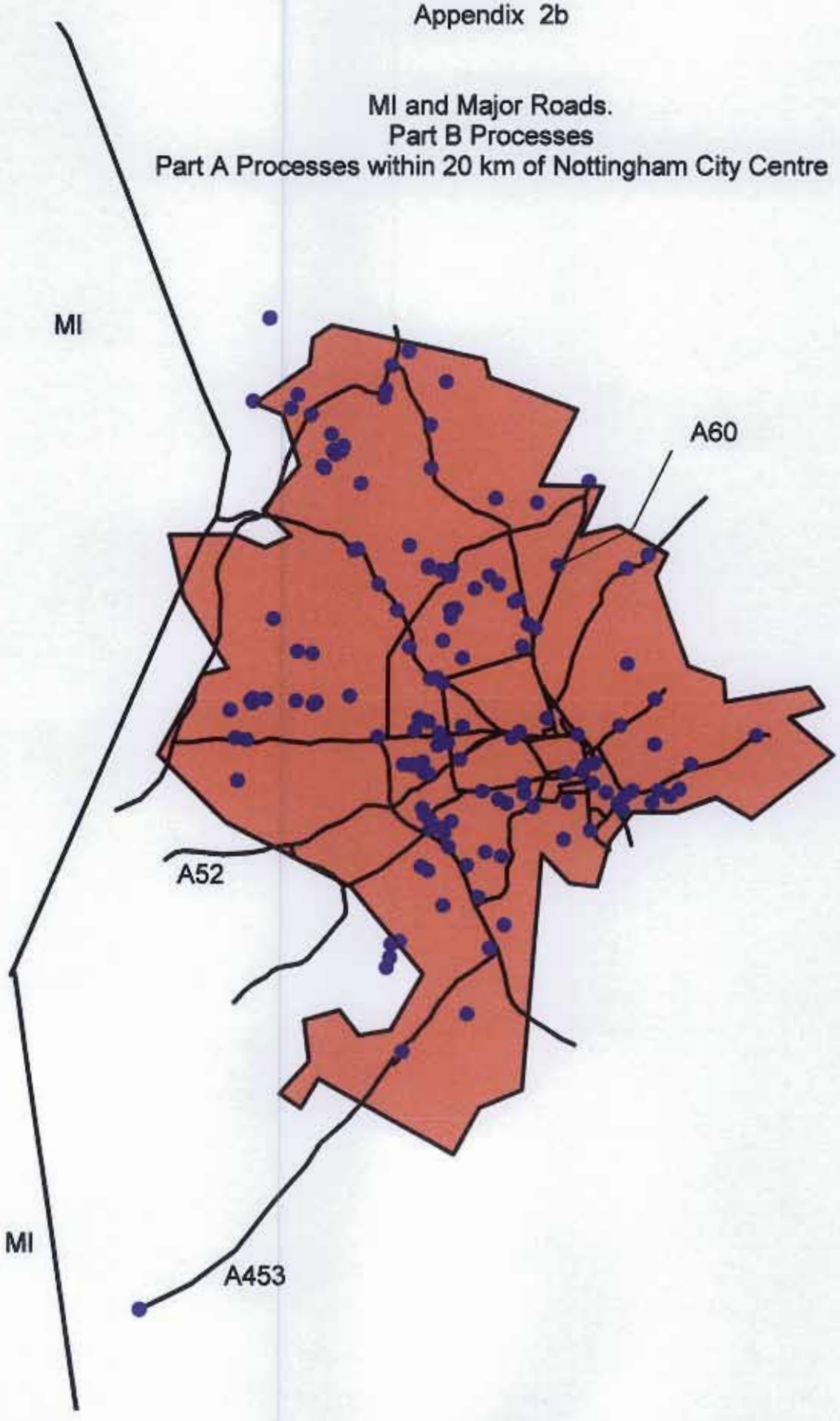
Appendix 2

City of Nottingham and surrounding District Councils
Part A Processes within 50 km of City Centre

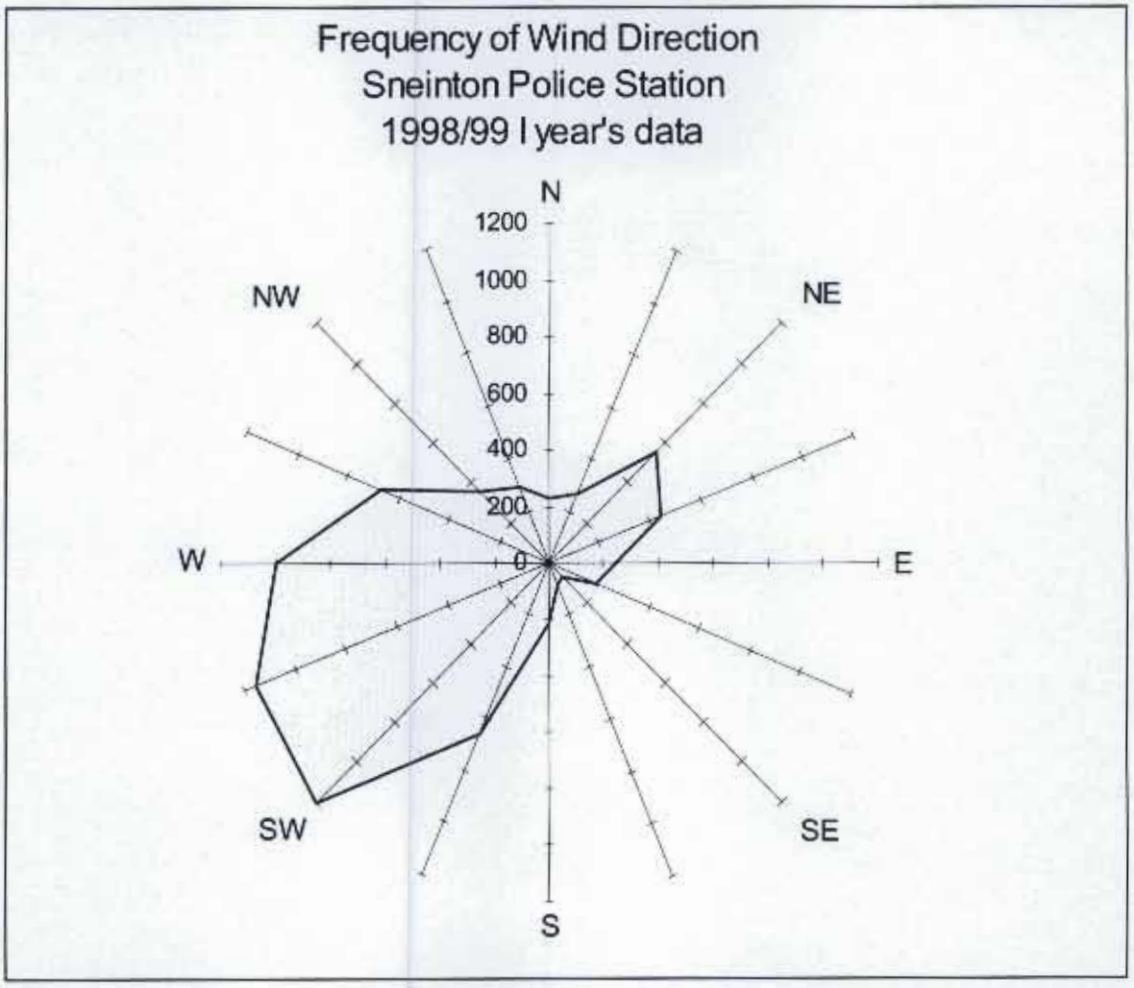


Appendix 2b

MI and Major Roads.
Part B Processes
Part A Processes within 20 km of Nottingham City Centre



Appendix 3


Frequency of Wind Direction
Sneinton Police Station
1998/99 I year's data
N
NE
E
SE
S
SW
W
NW
1200
1000
800
600
400
200
0

Appendix 4

Benzene Passive Diffusion Tube monitoring 1996 -1999

Undertaken by Gedling Borough Council – near petrol storage and transfer facility, Private Road, Netherfield, Nottingham

Benzene		Location			
		Private Road	Little Ricketts Lane	Crosslands Meadows	Bourne Mews
Sample Number	Date	Ppb	ppb	ppb	ppb
1	4/6-18/6 96	0.39			
2	31/7-14/8 96	0.24			
3	3/9-17/9 96	1.19			
4	3/10-18/10 96	1.91			
5	29/10-13/11 96	0.62			
6	3/12-7/1 97	0.95			
7	7/1-4/2 97	1.09			
8	4/2-4/3 97	0.35			
9	4/3-1/4 97	0.44			
10	April '97	0.69			
11	May '97	0.72			
12	June '97	0.16			
13	July '97	<0.03			
14	August '97	<0.03			
15	September '97	0.85			
16	October '97	1.19			
17	November '97	<0.03			
18	December '98	0.22			
19	January '98	0.78			
20	February '98	0.47			
21	March '98	0.11			
22	April '98	0.08			
23	May '98	n/r	n/r		
24	June '98	0.11	n/r		
25	July '98	0.13	n/r		
26	August '98	0.22	<0.03		
27	September '98	0.24			
28	October '98	0.08			
29	November '98	4.69	0.9	1.26	1.03
30	December '98	0.85	n/r	0.98	n/r
31	January '99	n/r	0.03	0.04	0.07
32	February '99	0.58	0.12	<0.03	<0.03
33	March '99	0.63	0.09	0.31	0.23
34	April '99	0.03	0.05	0.07	0.02
	n/r = null record				

Appendix 5

Table 2 Roadside Pollution Monitors - Average Carbon Monoxide Levels 1997 and 1998/99

RPM	Feb - Dec 1997 ppm	Jun 98 - May 99 ppm	RPM	Feb - Dec 1997 ppm	Jun 98 - May 99 ppm
Toll House Hill (1)	1.9	1.8	Gregory Blvd (7)	2.5	2.4
Milton St (2)	1.4	1.4	Carlton Rd (8)	1.1	2.4
London Rd (3)	3.0	2.7	Clifton Blvd (9)	1.6	1.8
Wollaton Rd (5)	1.4	1.4	Bentinck Rd (10)	-	2.5
Nuthall Rd (6)	2.0	2.0	Mansfield Rd (11)	-	2.8

Graph 1

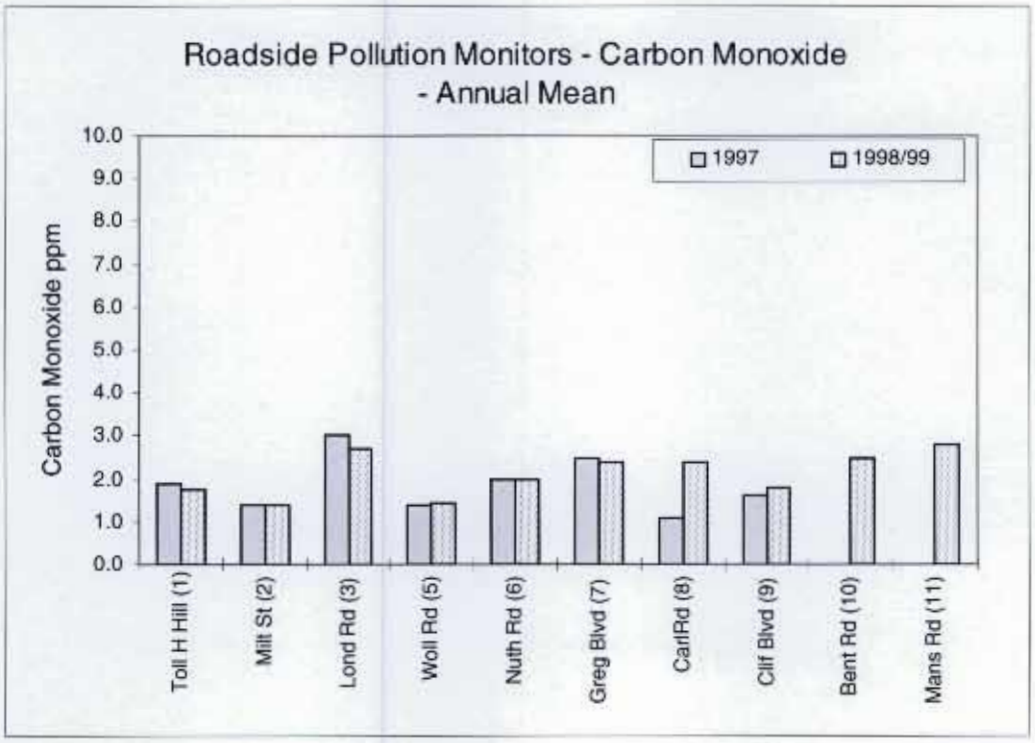


Table 3 Ambient Air Quality Monitoring - Carbon Monoxide

AUN	Mean ppm	Running 8 hour maximum	Number of Exceedences	AQMS	Mean ppm	Running 8 hour maximum	Number of Exceedences
1997	0.6	4.7	0	1997	0.5	-	-
1998	0.6	7.1	0	1998/99	0.2	-	-

Appendix 6

Table 4 Roadside Pollution Monitors - Average Nitrogen Dioxide Levels 1997 and 1998/99

RPM	Feb - Dec 1997 Ppb	Jun 98 - May 99 ppb	RPM	Feb - Dec 1997 ppb	Jun 98 - May 99 ppb
Toll House Hill (1)	22	40	Gregory Blvd (7)	30	56
Milton St (2)	30	33	Carlton Rd (8)	24	36
London Rd (3)	36	18	Clifton Blvd (9)	28	32
Wollaton Rd (5)	24	-	Bentinck Rd (10)	-	21
Nuthall Rd (6)	22	21	Mansfield Rd (11)	-	35

Graph 2

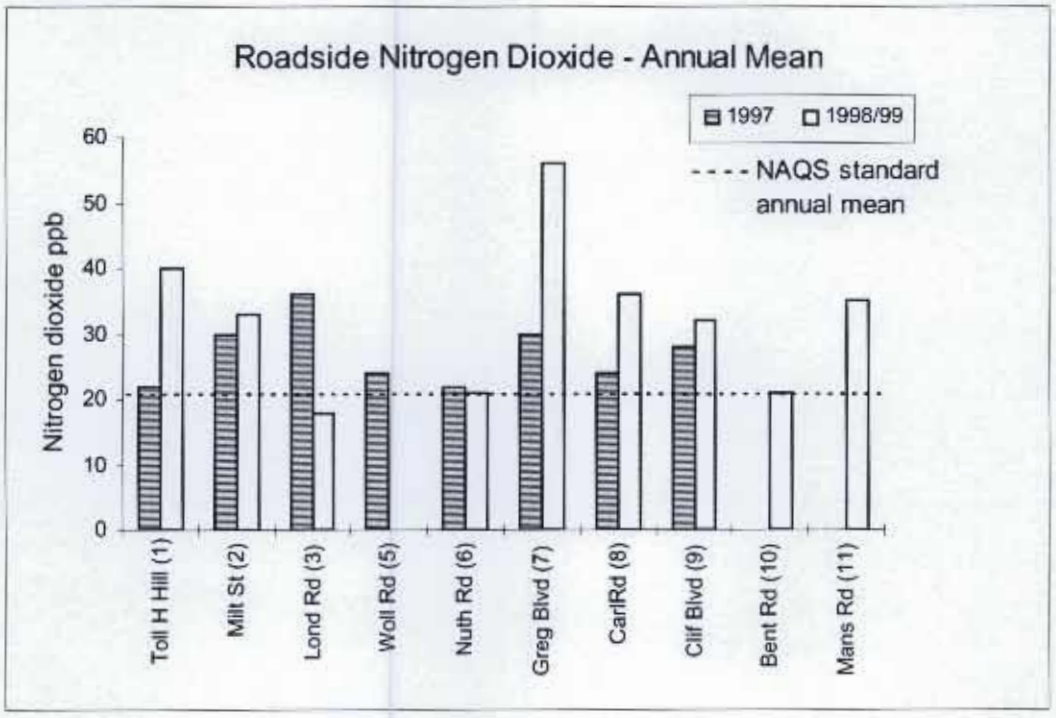


Table 5 Ambient Air Quality Monitoring - Nitrogen Dioxide

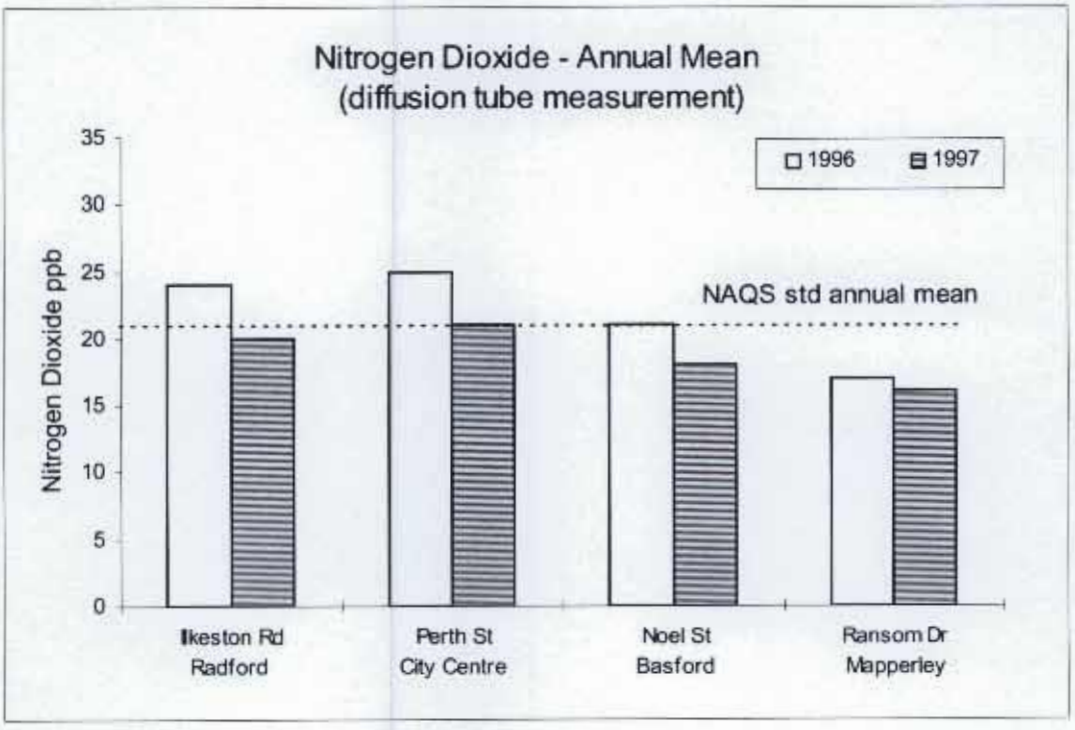
AUN	Mean ppb	Maximum 1 Hour	Number of Exceedences of hourly std	AQMS	Mean ppb	Maximum 1 Hour	Number of Exceedences of hourly std
1997	25	79	0	1997	21	86	0
1998	25	98	0	1998/99	21	95	0

Appendix 7

Table 6 Nitrogen Dioxide (diffusion tube) Annual Means

Site	Site Type	1996 ppb	1997 ppb
Ilkeston Rd Radford	Kerbside	24	20
Perth St City Centre	Intermediate	25	21
Noel St Basford	Urban background	21	18
Ransom Dr Mapperley	Urban background	17	16

Graph 3.



Appendix 8

Table 7 Sulphur Dioxide (peroxide bubbler) Annual Means

	Apr 1996 to Mar 1997		Apr 1997 to Mar 1998	
	Annual mean ppm	Maximum day ppm	Annual mean ppm	Maximum day ppm
Perth St City Centre	7	27	8	21

Graph 4.

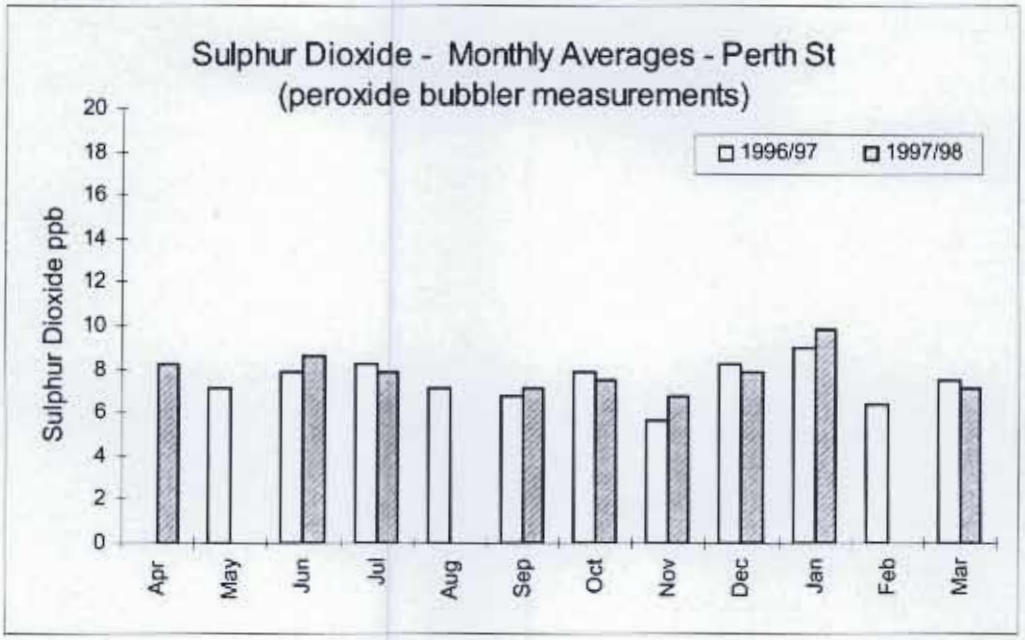


Table 8 Ambient Air Quality Monitoring - Sulphur Dioxide

	Mean ppb	Maximum 15 min	Number of Exceedences of 15 min std	AQMS	Mean ppb	Maximum 15 min	Number of Exceedences of 15 min std
	6	169	8 over 3 days	1997	4	132	6 over 3 days
	6	653	23 over 3 days	1998/ 99	3	641	25 over 4 days

Appendix 9

Table 9. Black Smoke (peroxide bubbler) Annual Means

	Apr 1996 to Mar 1997		Apr 1997 to Mar 1998	
	Annual mean ugs m-3	Maximum day ugs m-3	Annual mean ugs m-3	Maximum day ugs m-3
Perth St City Centre	11	75	12	64

Graph 5.

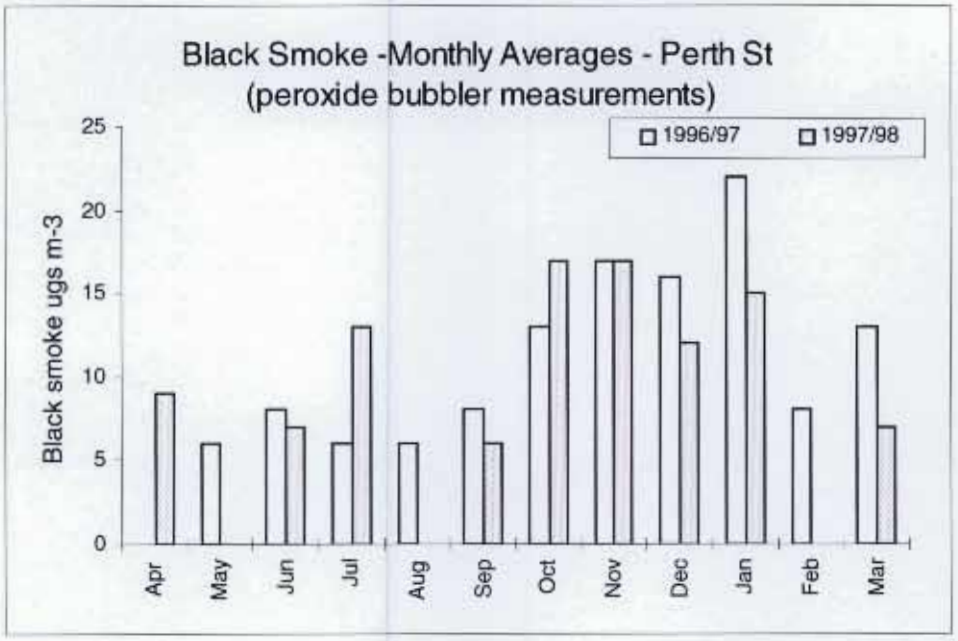
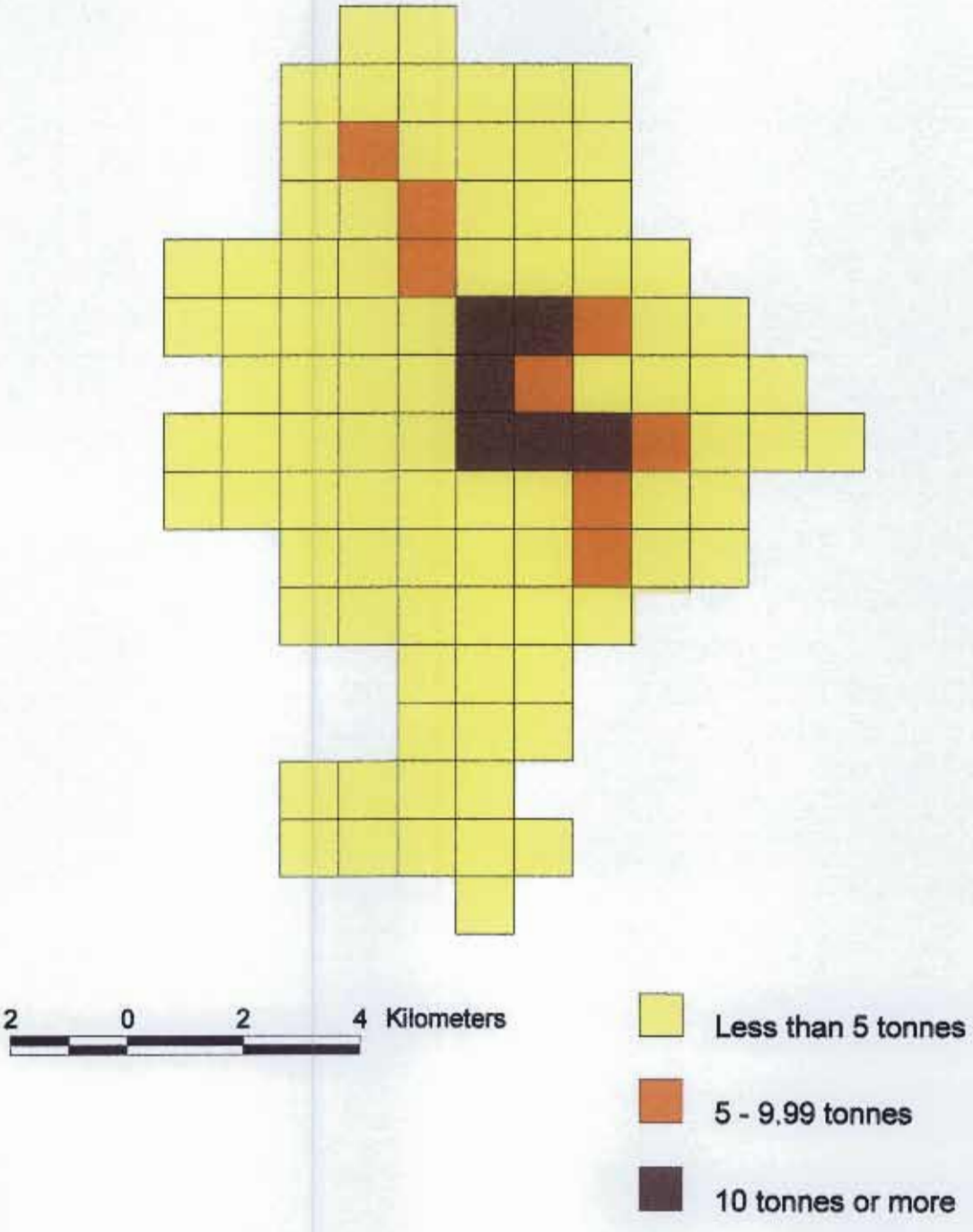


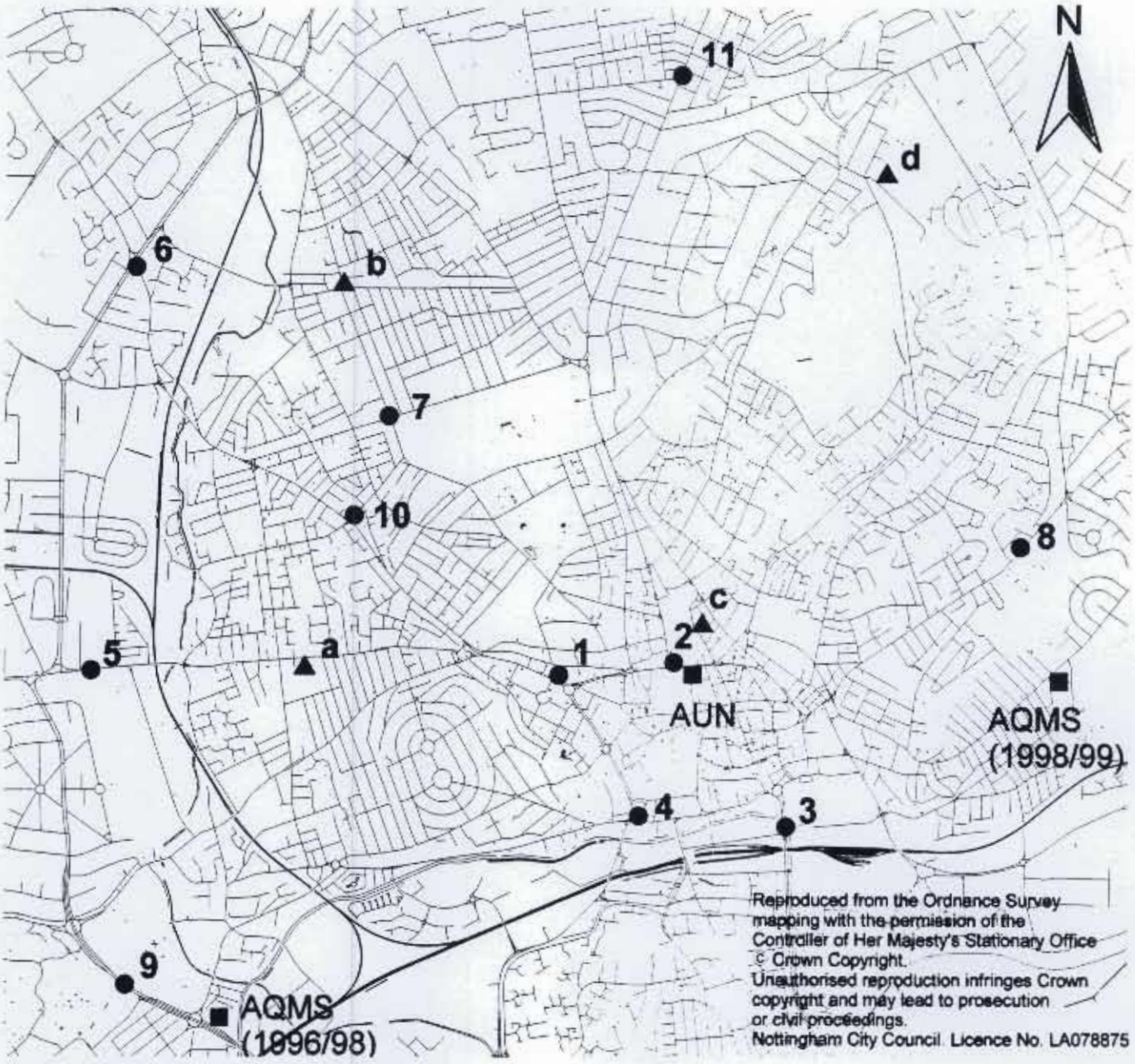
Table 10. Ambient Air Quality Monitoring - Particulates, PM10
TEOM measurement

AUN	Mean ug m^{-3}	Maximum Running 24 hr	Number of exceedences of running 24hr std	AQMS	Mean ug m^{-3}	Maximum running 24 hr	Number of exceedences of running 24hr std
1997	23	83	222 over 17 days	1997	26	106	420 over 38 days
1998	21	89	175 over 12 days	1998/99	18	-	-

Appendix 10
1997 PM10 Emissions
(Tonnes/year)



Appendix 11
Monitoring Site Locations



● Roadside Pollution Monitors

1	Toll House Hill	SK 568 401	
2	Milton St	SK 574 401	
3	London Rd	SK 579 393	
4	Castle Blvd	SK 572 394	
5	Wollaton Rd	SK 546 400	
6	Nuthall Rd	SK 548 420	
7	Gregory Blvd	SK 559 413	
8	Carlton Rd	SK 589 407	
9	Clifton Blvd	SK 548 386	
10	Bentinck Rd	SK 558 408	
11	Mansfield Rd	SK 574 429	

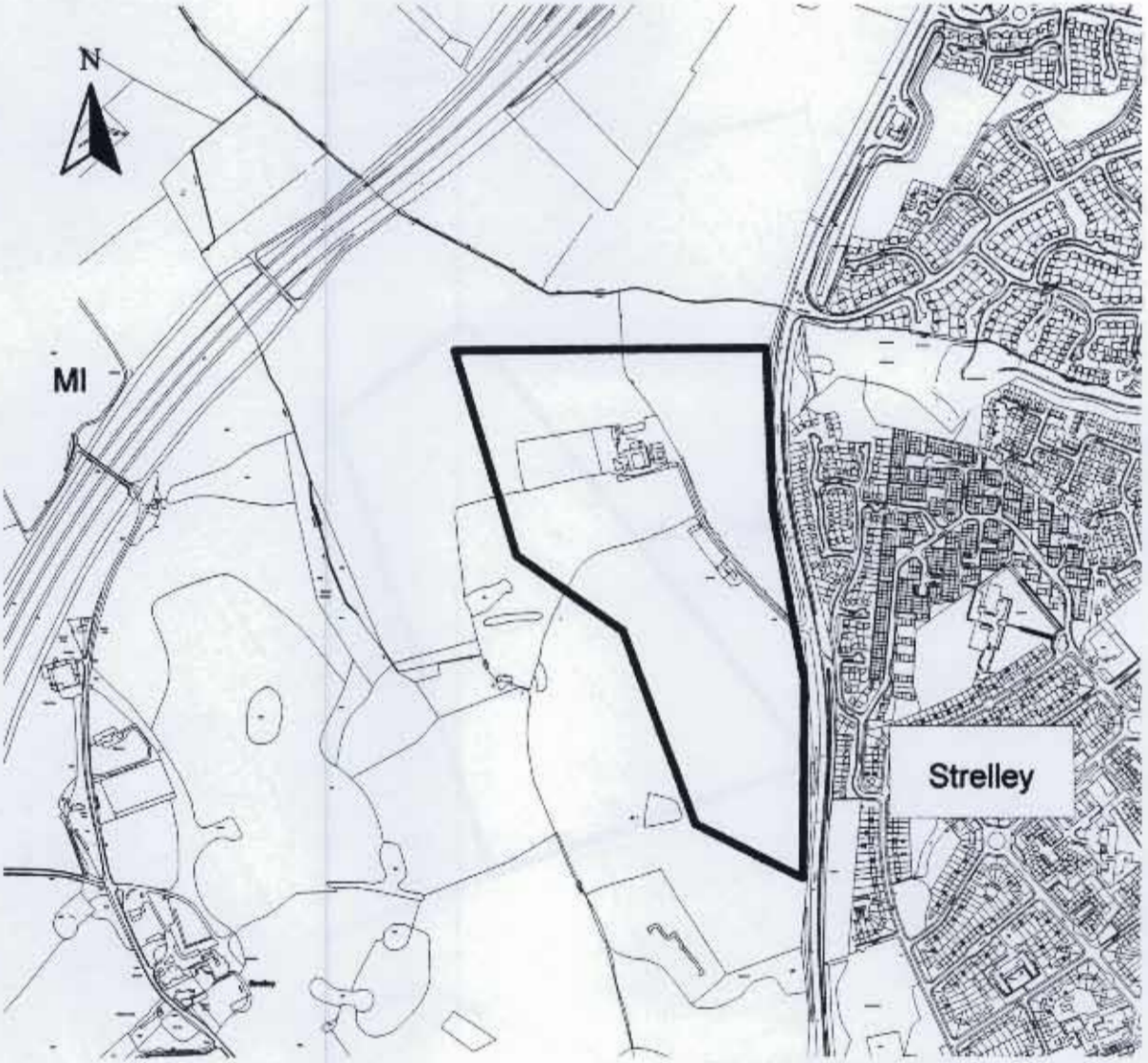
▲ Nitrogen Dioxide Diffusion Tubes

a	Ilkeston Rd	SK 556 401	
b	Noel St	SK 557 419	
c	Perth St	SK 574 403	
d	Ransom Drive	SK 582 424	

■ Ambient Air Quality Monitoring Stations

AUN	Clinton St East	SK 574 400
AQMS	Dunkirk Fire Station (1996/98)	SK 552 385
AQMS	Sneinton Dale (1998/99)	SK 592 401

Appendix 12
Proposed Developments
Chilwell Dam Farm -proposed business park -approximate site



200 0 200 400 Meters

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Proposed Developments
Clifton West - Residential - approximate site



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Appendix 13

Part A Processes most likely to release significant quantities of a specified substance to air.

PROCESS	BENZENE	1,3 - BUTADIENE	LEAD	CARBON MONOXIDE	SULPHUR DIOXIDE	NITROGEN DIOXIDE	PM10 (PARTICLES)
1.1(a) Reforming NG				X	X	X	
1.1(b) Relining NG					X	X	
1.1 (c)&(d) Gasification	X				X	X	X
1.2 Pyrolosis, carbonisation etc	X	X			X	X	X
1.3(a) Boilers and furnaces						X	X
1.3(b) Gas Turbines					X	X	
1.3(b) C I engines				X	X	X	X
1.3(c) Waste oil burning			X		X	X	X
1.3(c) Other waste burning					X	X	X

PROCESS	BENZENE	1,3 - BUTADIENE	LEAD	CARBON MONOXIDE	SULPHUR DIOXIDE	NITROGEN DIOXIDE	PM10 (PARTICLES)
2.1 Iron, steel & alloys				X	X	X	X
2.2 Non-ferrous			X	X	X	X	
3.1 Cement & lime					X	X	X
3.2 Asbestos							
3.3 Other Fibres					X	X	X
3.5 Glass			X		X	X	X
3.6 Ceramics (helton bricks)					X	X	X
4.1Petro-chemicals	X	X		X	X	X	X
4.2 Organic-chemicals	X	X			X	X	X
4.3 Acids					X	X	X
4.4 Halogens					X	X	X
4.5 Inorganics			X	X	X	X	X
4.6 Fertilisers					X	X	X

PROCESS	BENZENE	1,3 - BUTADIENE	LEAD	CARBON MONOXIDE	SULPHUR DIOXIDE	NITROGEN DIOXIDE	PM10 (PARTICLES)
4.7 Pesticides							
4.8 Pharma-ceuticals					X	X	
5.1 Incineration				X	X	X	X
5.2 Oil and solvent recovery	X				X	X	X
5.3 Fuel from waste							X
6.1 Paper					X	X	
6.2Di-isocyanates							
6.3 Tar and bitumen	X				X	X	X
6.5 Coating and printing					X	X	X
6.6 Dyestuffs and inks							
6.7 Timber							

Part B Processes most likely to release significant quantities of a specified substance to air.

PROCESS	BENZENE	1,3 - BUTADIENE	LEAD	CARBON MONOXIDE	SULPHUR DIOXIDE	NITROGEN DIOXIDE	PM10 (PARTICLES)
Waste Oil Combustion							
Combustion plant 20-50 MWth					X		X
WDFcombustion<3MWth					X	X	X
Reheat furnaces					X		X
Waste combustion 0.2-3 MWth						X	X
Petrol storage loading/unloading	X						
Unloading of petrol at filling stations							
Furnaces for extracting non-ferrous metals from scrap			X				
Galvanising							
Electrical and Rotary Furnaces			X				
Foundry processes							
Hot and Cold blast cupolas			X		X		
Aluminiumand aluminium alloy processes			X		X		

PROCESS	BENZENE	1-3 BUTADIENE	LEAD	CARBON MONOXIDE	SULPHUR DIOXIDE	NITROGEN DIOXIDE	PM10 PARTICLES
Zinc and zinc alloy processes			X		X		
Copper and copper alloy processes			X		X		
Metal decontamination					X	X	X
Blending, packaging, loading cement							
Manufacture of heavy clay goods and refractory goods					X		
Glass (excluding lead glass)					X	X	
Lead glass manufacture			X		X		X
Coal, coke, coal product and petroleum coke							X
Exfoliation of vermiculite /expansion of perlite							
Quarry processes							X
Plaster processes							
Lime processes							
Roadstone coating					X		X
China and ball clay and spray drying ceramics							X

PROCESS	BENZENE	1,3-BUTADIENE	LEAD	CARBON MONOXIDE	SULPHUR DIOXIDE	NITROGEN DIOXIDE	PM10 PARTICLES
Surface treatment of metals							
Incineration processes Crematoria							
Processes for the manufacture of particle board and fibreboard							
Textile and fabric coating processes (where nitrogen containing solvents are used)							
Manufacture of coating powder							X
Coil coatings (where nitrogen containing solvents are used)							X
Heat set web offset printworks							
Rubber processes		X					
Powder coating process							X
Metal and other thermal spraying process							

Appendix 14

Consultees	Address
Transco	Lime Tree Place Mansfield Notts NG18 2HZ
Boots	Head Office 1 Thane Road West Nottingham
Diamond Cable	Diamond Cable Communication UK Ltd Daleside Road Snenton Nottingham
Inland Revenue	Mowbray House Castle Meadow Road Nottingham
Greater Nottingham Co-operative Society	Upper Parliament Street Nottingham
Rolls Royce	Rolls Royce PLC Hucknall Nottingham NG15 6EU
McCartha Glen Development	BAA McArthur Glen (Castlewood Retail) Ltd Knightsbridge House 197 Knightsbridge Road London SW7 1AX
Developer Sherwood Business Park	English Partnerships David Cockcroft Millfield House Ervington Court Meridian Business Park Leicester LE3 2WL
R J Budge	RJB Mining (UK) Ltd Harworth Park Blyth Road Harworth Doncaster S. Yorks DN11 8DB
Stag Furniture	Stag Furniture PLC Haydn Road Nottingham NG5 1DU
Tarmac Topmix Ltd	Wergs Hall Wergs Hall Road Wolverhampton WV8 2HZ

Hanson Quarry Products Ltd	(ARC Central Premix East Midlands) The Ridge Chipping Sodbury Bristol BS17 6AY
Redland Readymix Ltd	Lafarge Redland Aggregates Ltd Northern Region PO BOX 36 Retford Road Worksop Notts S81 7YU
Central Trains Ltd	PO BOX 4323 Stainier House 10 Holliday Street Birmingham B1 1TH
Post Office	395 Mansfield Road Sherwood Nottingham
Severn Trent Water Ltd	2297 Coventry Road Birmingham B26 3PU
Yorkshire Water	Western House Halifax Road Bradford BD6 2LZ
Anglian Water Services Ltd	Ambre Road Huntingdon Cambridgeshire PE18 6NZ
Lincolnshire Road Car	PO Box 15 St Mark Street Lincoln LN5 7BB
Automobile Association	Norfolk House Priestley Road Basingstoke Hampshire RG24 9NY
RAC	Great Park Road Bristol BS12 4QN
Moxons Coaches	Maltby Road Oldcotes Worksop S81 8JN
Kettlewell Coaches	Grove Street Retford DN22 6LA

British Gas Trading Ltd	Bridge Street Leeds LS2 7PE
East Midlands Electricity	Mr R J Davies Corporate Officer PO BOX 444 Wollaton Nottingham NG8 3JP
Railtrack	Mr L Green Environmental Manager Railtrack Central Zone Stanier House 10 Halliday Street Birmingham B1 1TG
Midland Main Line Ltd	Midland House Nelson Street Derby DE1 2SA
Virgin Trains	85 Small Brook Queensway Birmingham B5 4HH
English Welsh & Scottish Railway Ltd	Mr I Gardiner Environmental Manager Canton TMD Leckwith Road Cardiff CF11 8HP
Trent Buses	Mansfield Road Heanor Derbys DE75 7BG
Nottingham City Transport	Mr J Pope Lower Parliament Street Nottingham NG1 1GG
Stage Coach (East Midlands)	Bridge Street Industrial Estate Clay Cross Derbys

Local Authority	Address
Leicestershire County Council	County Hall Glenfield Leicester LE3 8RA
North West Leicestershire District Council	Council Offices Coalville Leics LE67 3FJ

Rotherham Metropolitan Borough Council	Civic Buildings Walker Place Rotherham South Yorks S65 1HF
West Lindsey District Council	The Guildhall Gainsborough Lincs DN21 2DN
Doncaster Metropolitan Borough Council	Priory Place Doncaster South Yorks DN1 1BN
South Kesteven District Council	Council Offices St Peters Hill Grantham Lincs NG31 6PZ
North Kesteven District Council	Council Offices Kesteven Street Sleaford Lincs
Amber Valley District Council	Town Hall The Market Place Ripley Derbys
Bolsover District Council	Sherwood Lodge Bolsover Chesterfield Derbys
Derbyshire County Council	County Hall Matlock Derbys DE4 3AG
Melton Borough Council	Council Offices Nottingham Road Melton Mowbray Leics LE13 0UL
Charnwood Borough Council	Southfields Loughborough Leics LE11 2TX
West Lindsey District Council	The Guildhall Gainsborough Lincs DN21 2DN
Lincolnshire County Council	County Offices Newland Lincoln LN1 1YL

Broxtowe Borough Council	Council Offices Foster Avenue Beeston Nottingham NG9 1AB
Ashfield District Council	Urban Road Kirkby-in-Ashfield Nottingham NG17 8DA
Rushcliffe Borough Council	Civic Centre Pavillion Road West Bridgford Nottingham NG2 5FE
Gedling Borough Council	Civic Centre Arnot Hill Park Arnold Nottingham NG5 6LU
Newark and Sherwood District Council	Kelham Hall Newark Notts NG23 5QX

Name	**Address**
Cyclists Touring Club	C/O Nicholas Moss 21 Brockley Road West Bridgford Nottingham NG2 5JY
Road Haulage Society	Roadway House Bretton Centre Peterborough PE3 8DR
Health and Safety Executive	Pearson Building 55 Upper Parliament Street Nottingham NG1 6AU
English Nature	The Maltings Wharf Road Grantham Lincs NG31 6BH
DETR	Air & Env. Quality Division Floor 4/G10 Ashdown House 123 Victoria Street London SW1E 6DE
Mr G Hoon, MP	C/O 8 Station Street Kirkby in Ashfield

	Notts
Mr P Tipping, MP	C/O Council Offices (Housing) Watnall Road Hucknall Notts
Mr P K Johnson Planning Liaison Group (Nottinghamshire)	C/O Ashfield District Council Council Offices Urban Road Kirkby-in-Ashfield Nottinghamshsrie NG17 8DA
Solid Fuel Associates	7 Swanwick Court Alfreton Derbys DE55 7AS
Federation of Coal Merchants Association	7 Swanwick Court Alfreton Derbys DE55 7AS
Property Services Agency	Department of Environment Chilwell District Office Nottingham
British Road Federation	Pillar House 194 - 202 Old Kent Road London SW1 5TG
Local Railways Development Society	Albermarle Cottage Kirklington Road Eakring NG22 0DA
Nottinghamshire Transport 2000	261 Beckhampton Road Bestwood Park Nottingham NG5 5NE
Tony Newby	Manager Conservation Training Centre Chestnut Grove Burton Joyce Nottingham NG14 4DZ
Civil Aviation Authority	Aviation House Aerodrome Standards 3 South Area Gatwick Airport RH6 0YR
Civic Society, Nottingham	Ray Banks, Secretary 1 Ashley Close Chilwell Nottingham

	NG9 4BQ
Coal Authority	Mining Reports Office 200 Litchfield Lane Berry Hill Mansfield Nottinghamshire NG18 4RG
Community Health Council	319 Mansfield Road Nottingham NG5 2DA
Community Transport, Nottingham	Dave Tye, Co-ordinator Hooton Street Carlton Road Nottingham NG3 2NJ
Council for the Protection of Rural England, Notts Branch (CRPE)	Mrs Carol Collins, Secretary Church End 61 Main Street Kinoulton Nottingham NG12 3EL
Countryside Commission J Felton	1st Floor Vincent House Tindal Bridge 92-93 Edward Street Birmingham B1 2RA
English Nature R J Keymer	East Midlands Team The Maltings Wharf Road Grantham Lincs NG31 6BH
Forestry Commission	Midlands Conservancy Willingham Road Market Rasen Lincs LN8 3RQ
Greenpeace	Jane Burd 33 William Road West Bridgford NG2 7QD
NFU Mr P Tame	Agriculture House Northgate Upppingham Rutland LE15 9NX
Nottingham Health Commission	Standard Court Park Row

	Nottingham
	NG1 6GN
Nottinghamshire Wildlife Trust	Ms S Hilborne
	The Old Ragged School
	Brook Street
	Nottingham
	NG1 1EA
Nottingham Womens Environmental	7 Highfield Road
Network	Nuthall
Christine Vincent	Notts
	NG16 1BQ
Rural Development Commission	East Midlands Region
Mr P Stovey	18 Market Place
	Bingham
	Notts
	NG13 8PH
Technical Aid for Nottm Communities	Co-ordinator
Farida Makki	16 Robin Hood Chase
	St Ann's
	Nottingham
	NG3 4EZ
Transport 2000	Secretary
Oliver Elliott	25 Bosley Square
	Lenton Abbey
	Nottingham NG9 2TS
Wildlife Trust	310 Sneinton Dale
Erin McDaid	Nottingham
	NG3 7DN
Wind Power Project	Development Worker
Ian Pickering	176 Mansfield Road
	Nottingham
	NG1 3HW
Joe Ashton MP	House of Commons
	London
	SW1 0AA
East Midland Business and Environment	Rushcliffe Borough Council
Club	Civic Centre
Keith Wood	Pavilion Road
	West Bridgford
	Nottingham
	NG2 5FE
Green Business Network	Nottingham Trent University
Keith Melton	Burton Street
	Nottingham
Unison	East Midlands Regional Office
	15 Castle Gate
	Nottingham
TUC	General Secretary
	Congress House
	Great Russel Street

	London WC1 B3LS
Nick Palmer	MP for Broxtowe Borough 23 Barrett Lane Attenborough
Vernon Coker	MP Gedling House of Commons London
DEPAC	Malcolm Chatwood Derbyshire Dales DC Bakewell
YAPAC	Elmbank House c/o Rotherham Met Borough Council 73 Alma Road Rotherham South Yorks S60 2BU
Lincolnshire Pollution Group	W P Lambert c/o West Lindsey District Council 11/13 Cross Street Gainsborough Lincolnshire DN21 2AX
Leicestershire, Leicester and Rutland Air Quality Forum	c/o M R Holford Borough of Charnwood Macaulay House 5 Cattle Market Loughborough LE11 3DH
NSCA	Tim Brown 136 North Street Brighton
Mr C Heaton-Harris	MEP 2 Kingdown Road Epsom Surrey KG17 3PU
Mr N Clegg	MEP 52 Kirklington Road Southwell Notts NG25 0AX
Mr R Helmer	MEP Ivy House Farm Ashby Magna Lutterworth
Ms I Read MEP	27 Ashfield Road Stonygate Leicester LE2 1LB
Mr W Newton –Dunn MEP	27 Stergate Road London W14 0HY

Mr P Whithead MEP	Millhouse Rowsley Nr Bakewell Derbyshire DE 2EB
Fiona Jones MP	House of Commons London SW1 0AA
Ken Clark MP	House of Commons London SW1 0AA
Alan Meale MP	Parliamentry Office 5 Clumber Street Mansfield NG18 1NU

Title	FirstName	LastName	JobTitle	Company	Address1	Address2
Nottingham City Hospital	NHS Trust	Estates Department	Hucknall Road	Nottingham	NG5 1PB	Fao Mr R Shutter
Wrights & Dobson Limited	107 Carlton Road	Nottingham	NG3 2FB			Fao Mr J Charles
Bampton Packaging Limited	Lenton Lane	Nottingham	NG3 2FB			Fao Mr W Beal
The Director	Nottingham City Building Works	Harvey Road	Bilborough	Nottingham		Fao Mr P Clinch
Bell Fruit Manufacturing Limited	Leen Gate	Nottingham	NG7 2NR			Fao Mrs D Harvey
Vic Fearn & Company Limited	Crabtree Mill	Hempshill Lane	Nottingham			Fao Mr D G Crampton
Fitchett & Wollacott Limited	Willow Road	Lenton Lane	Nottingham	NG7 2PR		Fao Mr N McKenna
Manson Timber Limited	165 Loughborugh Road	Ruddington	Nottingham	NG11 6LY		Fao Mr Huddleston
Stag Meredew Furniture Limited	Haydn Road	Sherwood	Nottingham			Fao Mr Hartburn
ZAF Limited	Belgrave Road	Bulwell	Nottingham	NG6 8HG		Fao Mr Johnson
ZAF Limited	Radford Court	Ilkeston Road	Nottingham			Fao Mr Gallagher
Nixon Knowles	Longwall Avenue	Queens Drive Industrial Estate	Nottingham			Fao Mr P Hewlett
Conflow Limited	Triumph Road	Lenton	Nottingham			Fao Mr D Sheridan
A N Wallis & Company Limited	Greasley Street	Bulwell	Nottingham	NG6 8NJ		Fao Mr J S Gill
W J Furse & Co. Ltd.	The Meadows	Nottingham	NG2 1EB			Fao Mr H Lee
Universal Engineering	Radford Road	Basford	Nottingham	NG7 7NQ		Fao Mr M J Debbage
Castle Concrete Limited	Castle Meadow Road	Nottingham	NG2 1AG			Fao Mr A E Lockett
RMC Ready Mix (East Midlands) Limited	Re:- Radford Road Works, Nottingham	RMC House	Long Lane	Attenborough	Nottingham NG9 6BL	Fao Mr B R Hibbert
Lafarge Redland Aggregates Ltd.	Re:- Little Tennis Street, Nottingham	Bradgate House	Groby	Leicester	LE6 0FA	Fao Mr R Scawin
A1 Mini Mixed Concrete	Plot 8	Moorbridge Works	Bestwood Road	Bulwell	Nottingham	Fao Mr J Hillier
Tilcon (South) Limited	Re:- Little Tennis Street, Nottingham	Wormhill	Buxton	Derbyshire	SK17 8TG	Fao Mr A S Butler
Toton Plant Hire	Thames Street	Bulwell	Nottingham	NG6 8HW		Fao Mr Radford
Colwick Vale Coachworks	Colwick Road Crossing	Nottingham	NG2 4BH			Fao Mr T Hett
Arriva Ford	London Road	Nottingham	NG2 3AG			Fao Mr G Flowers
Arriva Renault	Ilkeston Road	Nottingham	NG7 3ET			Fao Mr J Berry
Hooleys Garage	Abbey Street	Lenton	Nottingham			Fao Mr G Clark
Hooleys Garage Limited	4 The Ropewalk	Nottingham				Fao Mr G Clark
Mann Egerton Company Limited	Rover House	408 Derby Road	Nottingham			Fao Mr A B Reed
New Crown Motor Sales Limited	Cinderhill Road	Bulwell	Nottingham			Fao Mr K A Bramley
Ransbrook Accident Repair Centre Limited	Freeth Street	Meadow Lane	Nottingham	NG2 3GT		Fao Mr A Washbrooks

Title	FirstName	LastName	JobTitle	Company	Address1	Address2
Selbys	Lortas Road	Basford	Nottingham			Fao Mr D Selby
Reg Vardy	Castle Bridge Road	Castle Marina	Nottingham			Fao Mr Turner
T D G Harris	Willow Road	Lenton	Nottingham	NG7 2SN		Fao Mr C Bullock
R H Commercial Vehicles Limited	Lenton Lane	Nottingham	NG7 2NR			Fao Mr R Cranstone
Godfrey Davis (Nottingham)	Queens Court	Lenton Lane	Nottingham	NG7 2NR		Fao Mr S Griffiths
Silverline Coachworks	Unit 18	Chettles Industrial Estate	Ilkeston Road	Nottingham		Fao Mr A Mollart
Thomas Fish & Sons Limited	Little Tennis Street	Nottingham				Fao Mr C M Parker
Beechdale Engineering	Dabell Avenue	Blenheim Industrial Estate	Bulwell	Nottingham	NG6 8WA	Fao Mr T Chaplin
Raleigh Industries Limited	Triumph Road	Nottingham	NG7 2DD			Fao Mr H Cholerton
Sawford Sheet Metal Limited	Dunkirk Road	Dunkirk	Nottingham	NG7 2LG		Fao Mr G Sawford
Blackburn Starling & Company Limited	Queens Drive	Nottingham	NG2 3AY			Fao Mr S Byfield
BPC Catalogues (Nottingham) Limited	Wigman Road	Aspley	Nottingham			Fao Mr D Brown
Hill & Tyler	Glaisdale Drive	Bilborough	Nottingham			Fao Mr A J Copper
J Howitt & Son Limited	Bennerley Road	Blenheim Industrial Estate	Bulwell	Nottingham		
Moore & Company (Nottingham) Limited	Haydn Road	Sherwood	Nottingham			
A R Wilson Packaging	151/3 Nottingham Road	off Lincoln Street	Basford	Nottingham		Fao Mr M Benton
Imperial Tobacco Limited	PO Box 61	West PDO	Nottingham	NG7 5QQ		Fao Mr B Taylor
Filtrauto Ltd.	Glaisdale Drive	Bilborough	Nottingham	NG8 4JX		Fao Mr M Drury
Leverton Environmental	2 Bulwell Lane	Old Basford	Nottingham	NG6 9FE		Fao Mr P Leverton
G & S Carplus	398A Alfreton Road	NOTTINGHAM		F.A.O. Mr S Attewell		
Grove Garage	First Avenue	Greasley Street	Bulwell	NOTTINGHAM		F.A.O. Mr A Gratton-Fisher
Kelley Commercial Vehicles	37-55 The Wells Road	St. Ann's	NOTTINGHAM			F.A.O. S Kelley
Mill Garage	45 Nuthall Road	NOTTINGHAM	NG8 5AS			F.A.O. Mr A Mucznih
Peatman & Cox	8 Bennerley Court	Blenheim Industrial Estate	Bulwell	NOTTINGHAM		F.A.O. Mr R Peatman
Bill Parker	Unit 2	(Rear of 178 Wollaton Road)	Wollaton	NOTTINGHAM		F.A.O. Mr B Parker
F H Saunderson	494 Radford Road	New Basford	NOTTINGHAM	NG7 7EA		F.A.O. Mr Saunderson
Skills Motor Coaches Ltd.	1 St. Peter's Street	NOTTINGHAM	NG7 3EZ			F.A.O. Mr N S A Skill
RMC Readymix (East Midlands) Ltd	Re Nottingham Mini	RMC House	Long Lane	Attenboroug	Nottingha	Fao Mr B R Hibbert

Title	FirstName	LastName	JobTitle	Company	Address1	Address2
	Mixed Concrete Ltd, Moorbirdge works			h	m	
Bridgeway Garage Services	122A Hucknall Road	Bulwell	Nottingham			Fao Mr D W Newbold
Nottingham Mini Mixed Concrete	Moorbridge Works	Bestwood Road	Bulwell	Nottingham		Fao Mr M Lanby
Nottingham Car Body Repairs	Mount Street	New Basford	Nottingham	NG7 7HX		Fao Mr N Harrison
Larfarge Redland Aggregates Limited	Re Harrimans Lane, Nottingham	Bradgate House	Groby	Leicester	LE6 0FA	Fao Mr R Scawin
TiTunstead Quarry I Wormhill Near Buxton Derbyshire SK17 8TG	Re Beasley Coated Stone					
Fao Mr A S Butler (South) Ltd						
Hawthornes	Palm Street	New Basford	Nottingham	NG7 7HS		Fao Mr Aubrey Williams
TiTunstead	Quarry I	Wormhill	Near Buxton	Derbyshire SK17 8TG	Fao Mr A S Butler	(South) Ltd.
Mr M G Khan	Afro-Caribbean and Asian Forum	Unit I	35 Ebury Road	Sherwood Rise	Nottingham NG5 1BB	
Afro-Caribbean National Artistic Centre (A.C.N.A)	Hungerhill Road	St. Ann's	NOTTINGHAM	NG3 4NB		
Broxtowe & Strelley Community Centre	Bramley Green	Broxtowe	NOTTINGHAM	NG8 6LG		
Clifton Community Centre	14 Southchurch Drive	Clifton	NOTTINGHAM	NG11 8AR		
Forest Fields Community Centre	Sturton Street	Forest Fields	NOTTINGHAM	NG7 6HU		
Highbury Vale Community Centre	Brooklyn Road	Highbury Vale	Bulwell	NOTTINGHAM	NG6 9EE	
Indian Community Centre	Rawson Street & Moseley Street	New Basford	NOTTINGHAM	NG7 7FR		
International Community Centre	61B Mansfield Road	NOTTINGHAM	NG1 3FN			
Pakistan Community Centre	163 Woodborough Road	St. Ann's	NOTTINGHAM			
Queens Walk Community Centre	Queens Walk	The Meadows	NOTTINGHAM	NG2 2DF		
Sheila Russell Community Centre	St. Martins Road	Bilborough	NOTTINGHAM	NG8 3AR		
Sherwood Community Centre	Woodthorpe House	Mansfield Road	Sherwood	NOTTM	NG5 2FN	

Appendix 15

List of respondents to consultation

Department of Environment, Transport and Regions,
Air and Environmental Quality Division
Floor 4/G10
Ashdown House
123 Victoria Street
London SW1E 6DE

Broxtowe Borough Council,
Directorate of Housing and Health
Council Offices
Foster Avenue
Beeston
Nottingham NG9 1AB

Ashfield District Council
Urban Road
Kirkby-in-Ashfield
Nottingham NG17 8DA

English Nature
The Maltings,
Wharf Road,
Grantham,
Lincolnshire NG31 6BH

R J B Mining (UK) Ltd
Harworth Park
Blythe Road
Harworth
Doncaster
South Yorkshire DN11 8DB

Severn Trent Water Ltd
Severn Trent Headquarters
2297 Coventry Road
Birmingham B26 3PU

Pedals
c/o Mr H Mclintock
162 Musters Road
West Bridgford
Nottingham NG2 7AA

Appendix 16

Responses from consultees

There were a total of 43 responses from the general republic and 23 responses from businesses.

The responses have been analysed and are detailed below, although specific comments have not been included :-

Responses from businesses and organisations:-

AIR QUALITY AND YOUR BUSINESS

1. How do you consider your business may affect air quality? (tick **all** boxes that apply)

Process emissions	83%	(19)
Raw materials	17%	(4)
Transportation (Goods and Materials)	61%	(14)
Travel to work	83%	(19)
Energy usage	70%	(16)
Waste disposal	43%	(10)

2. Do air quality issues affect your business?

Yes	0%	(0)
No	100%	(23)

3. What steps are your company taking or promoting to minimise the effect of your activities on air quality? (Tick **all** boxes that apply)

Car sharing	22%	(5)
Car pooling	4%	(1)
Providing company bus	4%	(1)
Providing cycle storage and staff shower facilities	39%	(9)
Adjusting delivery and distribution times	35%	(8)
Flexible working hours	13%	(3)
Working from home (i.e. improved IT)	17%	(4)
Company commitment to legislative requirements	61%	(14)
Upgrading process	65%	(15)
Changing production methods	48%	(11)
Using less polluting materials	83%	(19)
Improving energy efficiency	87%	(20)
Environmental Management Systems	39%	(9)
No smoking policy	57%	(13)

4. What do you see as the role of a Local Authority in dealing with Air Quality/Air Pollution? (Tick **all** boxes that apply)

Monitoring air quality	91%	(21)

Investigating incidents of air pollution	91%	(21)
Forecasting pollution episodes	39%	(9)
Publicising information	82%	(19)
Air quality education programmes (health, transport, etc)	78%	(18)
Setting up and enforcing smoke control areas (smokeless zones)	65%	(15)
Local management of air quality	52%	(12)
Enforcing Part B process authorisations	48%	(11)

5a. Are you aware of air quality monitoring undertaken nationally/locally and how to access the information.

Yes	35%	(9)
No	74%	(12)

5b. Does anybody within the organisation regularly access this information?

Yes	13%	(3)
No	91%	(21)

5c. Do they feel they can easily access relevant information?

Yes	17%	(4)
No	78%	(18)

6. When you are aware of air pollution episodes (by radio/TV/internet etc.), how do you modify your business operations and activities

Yes	0%	(0)
No	87%	(20)

IDEAS FOR ACTION

7. Which of the following would your company implement to minimise your emissions to atmosphere and so improve air quality? (Tick **all** boxes that apply)

Improving energy efficiency	87%	(20)
Upgrading manufacturing process	52%	(12)
Changing manufacturing processes	56%	(13)
Company commitment to legislative requirements	74%	(17)
Providing a car pool or alternative transport for staff?	4%	(1)
Using Alternative powered vehicles(Electric, natural gas, lpg)	20%	(5)
Providing cycle storage/shower facilities	39%	(9)
Withdrawing parking facilities from your staff?	0%	(0)
Adjusting delivery and distribution times	26%	(0)
Improving your vehicle fleet to meet lower/zero emission standards?	20%	(5)
Varying working hours	13%	(3)
Working from home (improved IT etc)	13%	(3)
Implementing a no smoking policy	34%	(8)

Environmental Management Systems	56%	(13)
None	0%	(0)

8. Would you modify or change your business operations to improve air quality if:

a. Your work force or delivery routes etc have to travel through an area where action is required to improve air quality

Yes at no extra cost	48%	(11)
Yes even if extra cost	22%	(5)
No	13%	(3)

b. Your business was within an area where action is required to improve air quality?

Yes at no extra cost	61%	(14)
Yes even if extra cost	26%	(6)
No	0%	()

c. If you operated your business adjacent to an area where action is required to improve air quality?

Yes at no extra cost	65%	(15)
Yes even if extra cost	22%	(5)
No	0%	(0)

9. Which of the following additional Local Authority powers would you support to control air pollution?

Increased car parking charges	30%	(7)
Reduced long term parking facilities	30%	(7)
Restricted vehicular access	30%	(7)
Roadside emission testing and on-the-spot fines	70%	(16)
Road tolls	8%	(2)
Road closures	0%	(0)
Restrictions on industrial operations	30%	(7)
Increased investigative and enforcement powers	43%	(10)

Responses from the general public:-

AIR QUALITY AND YOU

1. What do you think is you and your familys **main** contribution to air pollution? (Tick **one** box)

Car usage	42%	(18)
Domestic fuel usage:		
Solid fuel	2%	(1)
Oil	0%	(0)
Electricity	14%	(6)
Natural gas	14%	(6)
Use of solvents and paints	0%	(0)
Garden bonfires	2%	(1)
Smoking	5%	(2)
Unusable responses	21%	(9)

2. Did you know that the energy efficiency of your home has a direct effect on the amount of fuel you use and hence the amount of air pollution caused?

Yes	95%	(41)
No	5%	(2)

3. What do you think is the main air quality issue affecting or concerning you and your family? (Tick **one** box)

Traffic pollution	65%	(28)
Domestic smoke (bonfires and chimneys)	0%	(0)
Smoking	9%	(4)
Industrial smoke, fumes, gases and odours	0%	(0)
Green house gases and global warming	14%	(6)
Depletion of the Ozone layer	2%	(1)
Unusable response	9%	(4)

4. How do these air pollution issues affect you and your family? (Tick **all** boxes that apply)

Breathing difficulties (e.g. asthma and bronchitis etc.)	60%	(26)
Other health effects	21%	(9)
Stress/worry	30%	(13)
Unpleasant smells (e.g. need to shut windows)	49%	(21)
Extra cleaning/washing	37%	(16)
It doesn't directly affect me or my family	14%	(6)

5. What steps are you and your family taking to minimise your affects on air quality? (Tick **all** boxes that apply)

Reducing number of journeys by car	40%	(17)
Car/taxi sharing	16%	(7)
Using public transport more	70%	(30)

Making more use of cycling and walking	58%	(25)
Using alternative powered vehicles (electric, natural gas,lpg)	2%	(1)
Using cleaner fuel in existing vehicle (low sulphur diesel)	19%	(8)
Improving efficiency of car	12%	(5)
Using smokeless fuels in the home	28%	(12)
Improving energy efficiency in the home	42%	(18)
Recycling and composting	63%	(27)
Changing shopping behaviour	28%	(12)
Stopping smoking	7%	(3)
Nothing	2%	(1)

6 How do you **normally** travel?

	To Work		For Pleasure	
Car (on own)	26%	(11)	21%	(9)
Car (with others)	2%	(1)	33%	(14)
Walk	26%	(11)	60%	(26)
Cycle	9%	(4)	19%	(8)
Bus	33%	(14)	63%	(27)
Train/Tram	2%	(1)	16%	(2)

7a Are you aware that air quality monitoring is already being carried out?

Yes	81%
No	19%

7b Can you easily find information on air quality?

Yes	28%
No	72%

8 When you are aware of spells of high pollution (by radio/tv/internet etc) how do you behave differently?

Leave car at home	9%	(4)
Use public transport	26%	(11)
Walk	33%	(14)
Cycle	5%	(2)
Stay at home	16%	(7)
Postpone bonfires	12%	(5)
I don't	37%	(16)

9 What do you see as the role of the Council in dealing with Air Quality/Air Pollution? (Tick **all** boxes that apply)

Monitoring air quality	95%	(41)
Investigating and resolving incidents of air pollution	88%	(38)
Forecasting spells of high pollution	63%	(27)
Publicising information	84%	(36)
Setting up and enforcing smoke control areas (smokeless zones)	67%	(29)

Policing industrial emission	74%	(32)
Other local management of air quality	60%	(26)
Providing 'Park and Ride' facilities	72%	(31)

IDEAS FOR ACTION

10 What actions might you take in the future to help reduce air pollution? (Tick **all** boxes that apply)

Cycling	42%	(18)
Car sharing	33%	(14)
Using the Bus	63%	(27)
Using the Train/Tram	44%	(19)
Using Taxis	21%	(9)
Using alternative powered vehicles (electric, natural gas, lpg)	19%	(8)
Using cleaner fuel in existing vehicle	26%	(11)
Using smokeless fuels	21%	(9)
Improving energy efficiency in the home	26%	(11)
Recycling and composting	49%	(21)
Changing shopping behaviour	19%	(8)
Stopping smoking	16%	(7)
None	7%	(3)

11. Would you modify or change your behaviour if:

a. You have to travel through an area where action is required to improve air quality?

Yes, at no extra cost	42%	(18)
Yes, at even if extra cost	33%	(14)
No	19%	(8)

b. You live within an area where action is required to improve air quality?

Yes, at no extra cost	37%	(16)
Yes, at even if extra cost	44%	(19)
No	12%	(5)

12. Would you change your fuel to a different 'less polluting' type if:

a. You lived in an area where action is required to improve air quality?

Yes, at no extra cost	49%	(21)
Yes, at even if extra cost	35%	(15)
No	14%	(6)

b. If you lived adjacent to an area where action is required to improve air quality?

Yes, at no extra cost	49%	(21)
Yes, at even if extra cost	30%	(13)
No	16%	(7)

13 Which of the following additional council powers would you support to control Air Pollution? (Tick **all** boxes that apply)

Increased car parking charges	35%	(15)
Reduced long term parking facilities	35%	(15)
Restricted vehicular access to town and city centres	72%	(31)
Road tolls	28%	(12)
Road closures	44%	(19)
Roadside emission testing and on-the-spot fines	74%	(32)
Restrictions on industrial operations	60%	(26)
Setting up and enforcement of Smoke Control Areas	63%	(27)
Other local management of air quality	47%	(20)
Action to curb smoking	42%	(18)

Appendix 17

Air Quality Questionnaire: Business and Organisation version

Please complete this questionnaire – it will take no more than 10 minutes and it may help your business in the future.

As part of (DISTRICT COUNCIL)'s Air Quality Review and Assessment we are seeking your views about the way we have undertaken the Review and Assessment and we want to know what you think about air quality, what we've done and what else you think we should do.
Please tick appropriate box(es) for each question

AIR QUALITY AND YOUR BUSINESS

1. How do you consider your business may affect air quality? (tick **all** boxes that apply)

   Process emissions
   Raw materials
   Transportation (Goods and Materials)
   Travel to work
   Energy usage
   Waste disposal

   Other, please specify:-
   .....
   .....

2. Do air quality issues affect your business? If so how?
   .....
   .....

3. What steps are your company taking or promoting to minimise the effect of your activities on air quality? (Tick **all** boxes that apply)

   Car sharing
   Car pooling
   Providing company bus
   Providing cycle storage and staff shower facilities
   Adjusting delivery and distribution times
   Flexible working hours
   Working from home (i.e. improved IT)
   Company commitment to legislative requirements
   Upgrading process
   Changing production methods
   Using less polluting materials

Improving energy efficiency
Environmental Management Systems
No smoking policy

Other, please specify:
.....
.....

4. What do you see as the role of a Local Authority in dealing with Air Quality/Air Pollution? (Tick **all** boxes that apply)

Monitoring air quality
Investigating incidents of air pollution
Forecasting pollution episodes
Publicising information
Air quality education programmes
(health, transport, etc)
Setting up and enforcing smoke control areas
(smokeless zones)
Local management of air quality
Enforcing Part B process authorisations

Other - please specify .....

5a. Are you aware of air quality monitoring undertaken nationally/locally and how to access the information.

Yes
No

5b. Does anybody within the organisation regularly access this information?

Yes
No

5c. Do they feel they can easily access relevant information?

Yes
No

6. When you are aware of air pollution episodes (by radio/TV/internet etc.), how do you modify your business operations and activities

Please specify:
.....

IDEAS FOR ACTION

7. Which of the following would your company implement to minimise your emissions to atmosphere and so improve air quality? (Tick **all** boxes that apply)

Improving energy efficiency
Upgrading manufacturing process
Changing manufacturing processes
Company commitment to legislative requirements
Providing a car pool or alternative transport for staff?
Using Alternative powered vehicles(Electric, natural gas, lpg)
Providing cycle storage/shower facilities
Withdrawing parking facilities from your staff?
Adjusting delivery and distribution times
Improving your vehicle fleet to meet lower/zero emission standards?
Varying working hours
Working from home (improved IT etc)
Implementing a no smoking policy
Environmental Management Systems
None

Other – please specify;.....

8. Would you modify or change your business operations to improve air quality if:

a. Your work force or delivery routes etc have to travel through an area where action is required to improve air quality
Yes
No

b. Your business was within an area where action is required to improve air quality?
Yes
No

c. If you operated your business adjacent to an area where action is required to improve air quality?
Yes
No

9. Which of the following additional Local Authority powers would you support to control air pollution?

Increased car parking charges
Reduced long term parking facilities
Restricted vehicular access
Roadside emission testing and on-the-spot fines

Road tolls
Road closures
Restrictions on industrial operations
Increased investigative and enforcement powers

Other - please specify: .....

10. Any further comments

.....
.....
.....

11. Contact details.

Company name.....
Address.....
.....
Contact name.....
Telephone
number.....

THANKYOU for completing the questionaire,

A prepaid envelope is provided for return of the questionnaire.

For further details regarding air quality issues in Nottingham – or help completing this questionniare please contact:

The Pollution Control Section
Nottingham City Council
Environmental Services Department
Lawrence House
Talbot Street
Nottingham NG1 5NT

Tel: 0115 915 6410
Fax: 0115 915 6145

Air Quality Questionnaire: General public version

Please join in with this important debate and let us know what you think. A few minutes of your time may help improve the quality of the air you breathe.

As part of (DISTRICT COUNCIL)'s Air Quality Review and Assessment we are seeking your views about the way we have undertaken the Review and Assessment and we want to know what you think about what we've done and what else you think we should do.
Please tick the appropriate box(es) for each question

AIR QUALITY AND YOU

1. What do you think is you and your familys **main** contribution to air pollution? (Tick **one** box)

   Car usage
   Domestic fuel usage:
   - Solid fuel
   - Oil
   - Electricity
   - Natural gas

   Garden bonfires
   Smoking
   Others please specify: .....

2. Did you know that the energy efficiency of your home has a direct effect on the amount of fuel you use and hence the amount of air pollution caused?

   Yes
   No

3. What do you think is the main air quality issue affecting or concerning you and your family? (Tick **one** box)

   Traffic pollution
   Domestic smoke (bonfires and chimneys)
   Smoking
   Industrial smoke, fumes, gases and odours
   Green house gases and global warming
   Depletion of the Ozone layer

   Others please specify: .....

4. How do these air pollution issues affect you and your family? (Tick **all** boxes that apply)

   Breathing difficulties (e.g. asthma and bronchitis etc.)
   Other health effects
   Stress/worry

Unpleasant smells (e.g. need to shut windows)
Extra cleaning/washing
It doesn't directly affect me or my family

Other, please specify:
.....
.....

5. What steps are you and your family taking to minimise your affects on air quality? (Tick **all** boxes that apply)

Reducing number of journeys by car
Car/taxi sharing
Using public transport more
Making more use of cycling and walking
Using alternative powered vehicles (electric, natural gas,lpg)
Using cleaner fuel in existing vehicle (low sulphur diesel)
Improving efficiency of car
Using smokeless fuels in the home
Improving energy efficiency in the home
Recycling and composting
Changing shopping behaviour
Stopping smoking
Nothing

Other - please specify: .....
.....

6 How do you **normally** travel? To Work For Pleasure

Car (on own)
Car (with others)
Walk
Cycle
Bus
Train/Tram

Other, please specify .....

7a Are you aware that air quality monitoring is already being carried out?
Yes
No

7b Can you easily find information on air quality?
Yes
No

8 When you are aware of spells of high pollution (by radio/tv/internet etc) how do you behave differently?

Leave car at home
Use public transport
Walk
Cycle
Stay at home
Postpone bonfires
I don't

Other - please specify: .....

9 What do you see as the role of the Council in dealing with Air Quality/Air Pollution? (Tick **all** boxes that apply)

Monitoring air quality
Investigating and resolving incidents of air pollution
Forecasting spells of high pollution
Publicising information
Setting up and enforcing smoke control areas (smokeless zones)
Policing industrial emission
Other local management of air quality
Providing 'Park and Ride' facilities

Other - please specify:
.....

IDEAS FOR ACTION

11 What actions might you take in the future to help reduce air pollution? (Tick **all** boxes that apply)

Cycling
Car sharing
Using the Bus
Using the Train/Tram
Using Taxis
Using alternative powered vehicles (electric, natural gas, lpg)
Using cleaner fuel in existing vehicle
Using smokeless fuels
Improving energy efficiency in the home
Recycling and composting
Changing shopping behaviour
Stopping smoking
None

Other - please specify:
.....

11. Would you modify or change your behaviour if:

a. You have to travel through an area where action is required to improve air quality?

Yes, at no extra cost
Yes, at even if extra cost
No

b. You live within an area where action is required to improve air quality?

Yes, at no extra cost
Yes, at even if extra cost
No

12. Would you change your fuel to a different 'less polluting' type if:

a. You lived in an area where action is required to improve air quality?

Yes, at no extra cost
Yes, at even if extra cost
No

c. If you lived adjacent to an area where action is required to improve air quality?

Yes, at no extra cost
Yes, at even if extra cost
No

13 Which of the following additional council powers would you support to control Air Pollution? (Tick **all** boxes that apply)

Increased car parking charges
Restricted vehicular access to town and city centres
Road tolls
Road closures
Roadside emission testing and on-the-spot fines
Restrictions on industrial operations
Setting up and enforcement of Smoke Control Areas
Other local management of air quality
Action to curb smoking

Other - please specify: .....

14 Any other comments?

.....
.....
.....

THANKYOU for completing the questionaire,

A prepaid envelope is provided for return of the questionnaire.

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