



Air Quality Progress Report

Durham City Council
March 2008

Overview

The City of Durham Council is required to undertake periodic assessments and reviews of local air quality within the District. These reports are submitted to the Department of Environment Food and Rural Affairs (DEFRA). A phased approach has been adopted to carry out reviews and assessments of air quality. The first phase is an Updating and Screening Assessment that aims to identify risks that air quality objectives may be exceeded. Where a risk of one or more objectives being exceeded is determined a Detailed Assessment must be undertaken. The City of Durham Council submitted a Detailed Report on nitrogen dioxide in September 2007 which is not yet accepted by DEFRA. In years where neither a Screening or Detailed assessment is required, then a Progress Report must be produced.

To undertake this work, the City of Durham Council engaged Faber Maunsell to review the required data in accordance with statutory guidance. Their report constitutes the Progress Report required by DEFRA.

The City of Durham Council accepts the findings within the report and will take these forward together with the recommendations of the Detailed Assessment when accepted by DEFRA.

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1 Introduction

This report constitutes the Air Quality Progress Report for Durham City Council, as required under the Local Air Quality Management regime, set up in Part IV of the Environment Act 1995. The report provides an update to air quality issues in the City since the publication of the Updating and Screening Assessment, in 2006, and Detailed Assessment of Air Quality in September 2007.

1.1 Overview of Air Quality Legislation and Policy

1.1.1 *Overview of Recent Air Quality Legislation and Policy*

The provisions of Part IV of the Environment Act 1995 (Defra, 2003a) establish a national framework for air quality management, which requires all local authorities in England, Scotland and Wales to conduct local air quality reviews. Section 82(1) of the Act requires these reviews to include an assessment of the current air quality in the area and the predicted air quality in future years. Should the reviews indicate that the standards prescribed in the Air Quality Strategy (TSO, 2007) will not be met, the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level to ensure that air quality in the area improves. This process is known as 'local air quality management'.

1.1.2 *The Phased Approach to Review and Assessment*

Each round of the Review and Assessment process has been split into two phases (as required by legislation and government guidance (Defra, 2003a, b, c): an Updating and Screening Assessment and a Detailed Assessment.

The aim of the first phase, the Updating and Screening Assessment (USA), is to review the changes in air quality that have occurred within each local authority since the previous round of review and assessment, and to re-examine locations and sources that were highlighted as issues at that stage.

In addition, local authorities are required to produce Air Quality Progress Reports, for years when no Updating and Screening or Detailed Assessments are due. All monitoring data and other information important with regard to local air quality should be included in the Progress Reports (Defra, 2003b).

Where a risk is identified that an air quality objective may be exceeded (which had not been identified previously), the local authority must undertake a Detailed Assessment. The aim of this assessment is to determine with as much certainty as is possible whether or not an air quality objective will be exceeded. If an exceedence is predicted, the local authority should designate an AQMA to cover the area of the exceedence.

1.1.3 *Air Quality Strategy*

The Air Quality Strategy identifies several ambient air pollutants that have the potential to cause harm to human health. These pollutants are associated with local air quality problems, with the exception of ozone, which is recognised as being a regional problem.

The Air Quality Standards Regulations set standards for the seven pollutants that are associated with local air quality (Appendix A). These objectives aim to reduce the health impacts of the pollutants to negligible levels. In 2010, EU air quality limit values on pollutant concentrations will apply in the UK. EU limit values are mandatory under EU law and the government will be required to meet them.

1.2 Review of Previous Durham City Council Assessments

During the second round of Review and Assessment, the 2004 Updating and Screening Assessment (USA) (DCC, 2004) determined that the UK Air Quality Objectives were unlikely be exceeded within the City of Durham administrative area. The Air Quality Progress Report 2005 (DCC, 2005) recommended that a Detailed Assessment should be produced with regards to NO₂ based on results from new diffusion tube sites. However, following consultation with Defra,

an enhanced diffusion tube monitoring programme was agreed that would better determine the requirement for a Detailed Assessment.

Following the 2006 USA (DCC, 2006) Defra requested that a Detailed Assessment be carried out for NO₂, due to a risk of the NO₂ annual mean standard being exceeded at a number of the new diffusion tube locations in Durham, as a result of emissions from road traffic. The Detailed Assessment undertaken in 2007 (DCC, 2007) recommended that an AQMA be declared for NO₂ including the Highgate and Clements Wharf residential developments. No declaration of this AQMA has yet been made, with Durham City Council awaiting comments on the Detailed Assessment by Defra.

1.3

Report Layout

The report details all the changes that have taken place within the City that would have the potential to affect air quality.

- Section 2.1 refers to pollutant monitoring;
- Section 2.2 details new or proposed industrial processes, and sites with the potential to impact on dust;
- Section 2.3 details new or proposed developments;
- Section 2.4 looks at local policies and strategies relevant to air quality;
- Section 3 provides a summary of the report; and
- Section 4 provides a list of references.

Additional information is available in the Appendices.

2 Progress Report

2.1

Air Quality Monitoring

Nitrogen dioxide has been monitored using diffusion tubes at a number of sites. No continuous monitoring has been undertaken within the City. Details of the monitoring are provided in Table 1, and location maps are provided in Appendix B.

The diffusion tubes were supplied and analysed by Jesmond Dene laboratories, using a 50% TEA in acetone preparation. The annual mean data have been bias-adjusted using factors provided by Defra. At the time of writing, the bias adjustment factor calculated for the Jesmond Dene laboratories for 2007 was 0.74 (spreadsheet version number 02/08, UWE Air Quality Review and Assessment Helpdesk Website (UWE, 2008), which has been applied to the measured data in Table 1.

Figure 1 shows the monitoring trends from the sites described in Table 1. Figure 2 and Figure 3 in Appendix B show the locations of the diffusion tubes in Durham City.

- Data for certain sites where there has been low data capture, or for sites which were commissioned mid-way through a year, have been seasonally adjusted using guidance detailed in LAQM.TG(03) Box 6.5.
- In Table 1, data in excess of the 2005/2010 annual mean standard are indicated with shading. Unless indicated otherwise in the table notes, the annual mean values are based on 10 months data or more.
- Clear trends are hard to identify; nevertheless for most sites annual mean concentrations rose between 1993 and 2003, dropped between 2003 and 2005, falling from 2006-7. The annual mean NO₂ concentration measured at Milburngate for 2007 is seen to decrease by approximately 50% relative to 2006. This is due to the relocation of the diffusion tube in May 2007, to a new residential development at 427358, 542603 (labelled D1b in Figure 2 and Figure 3).
- None of the NO₂ annual means recorded in 2007 exceed the UK objective of 40 µg/m³, however sites D5, D13 and D14 show concentrations close to the objective. Should the bias adjustment factor for 2007 be amended to give a higher adjustment factor, this may mean that the annual mean concentrations at these sites could exceed the objective. D5 is located on North Road, adjacent to the bus station. There are no residential properties on North Road and it is not considered relevant in terms of the annual mean NO₂ objective. Site D13 represents sites of relevant exposure, and is located at the façade of the recently constructed Highgate residential properties.

Table 1: NO₂ Diffusion Tube Annual Mean Bias-Adjusted Results (µg/m³)

Year	Tube ID, Location, Grid Reference and Site Type (R, Roadside; UB, Urban Background)														
	D1a Milburngate ^e	D1b	D2 Claypath	D3 Byland Lodge	D4 McNally Place	D5 North Road	D6 A167	D7 Rennys Lane	D8 Alma Place	D9 Snipperley	D10 Howlands Farm	D11 Ramside	D12 Highgate South	D13 Highgate North	D14 Gilesgate
	427210, 542643	427358, 542603	-	426541, 542304	428650, 542925	427038, 542563	425970, 542520	429860, 542840	429840, 543260	425997, 544143	427020, 540780	430830, 544540	427134, 542690	427126, 542837	428336, 542721
	R	R	-	UB	UB	R	R	R	R	R	R	R	R	R	R
1993	35.2		22.6	20.6	16.9										
1994	14.3		11.2	11.3	10.4										
1995	25.1		17.0	11.2	15.0										
1996	30.4		17.9	13.7	16.6										
1997	33.7		24.1	16.4	17.4	42.3									
1998	35.4		22.1	14.9	15.7	43.2									
1999	34.8		20.3	15.9	18.0	41.0									
2000	35.0		22.9	14.1	18.5	37.0									
2001	38.6			19.4	22.5	34.2									
2002	42.8			26.1	28.6	31.1									
2003	52.3			18.2	20.6	47.3	36.5								
2004	41.7			19.1	18.2	41.1	22.5								
2005	46.0			16.2	16.8	38.7	21.6	23.9	25.9	21.7	19.3	28.3	43.1 ^a	56.9 ^a	
2006	50.2 ^b			18.5	20.3	43.5	22.7	27.2	34.6	21.7	26.4	32.4	37.7	46.3	
2007		22.2 ^{d, e}		- ^c	- ^c	37.2 ^d	- ^c	- ^c	25.7 ^d	- ^c	- ^c	27.0 ^d	32.6 ^d	37.8 ^d	39.0 ^{d, f}

Notes: Mean values over the 2005/2010 objective/limit value are indicated with shading;

^a – monitoring commenced in August 2005, the annual mean values have been seasonally adjusted using urban background AURN data from Stockton-on-Tees (Yarm) and Sunderland (Silkworth) using guidance detailed in LAQM.TG(03) Box 6.5;

^b – based on 8 months' data, the annual mean values have been seasonally adjusted using urban background AURN data from Stockton-on-Tees (Yarm) and Sunderland (Silkworth) using guidance detailed in LAQM.TG(03) Box 6.5;

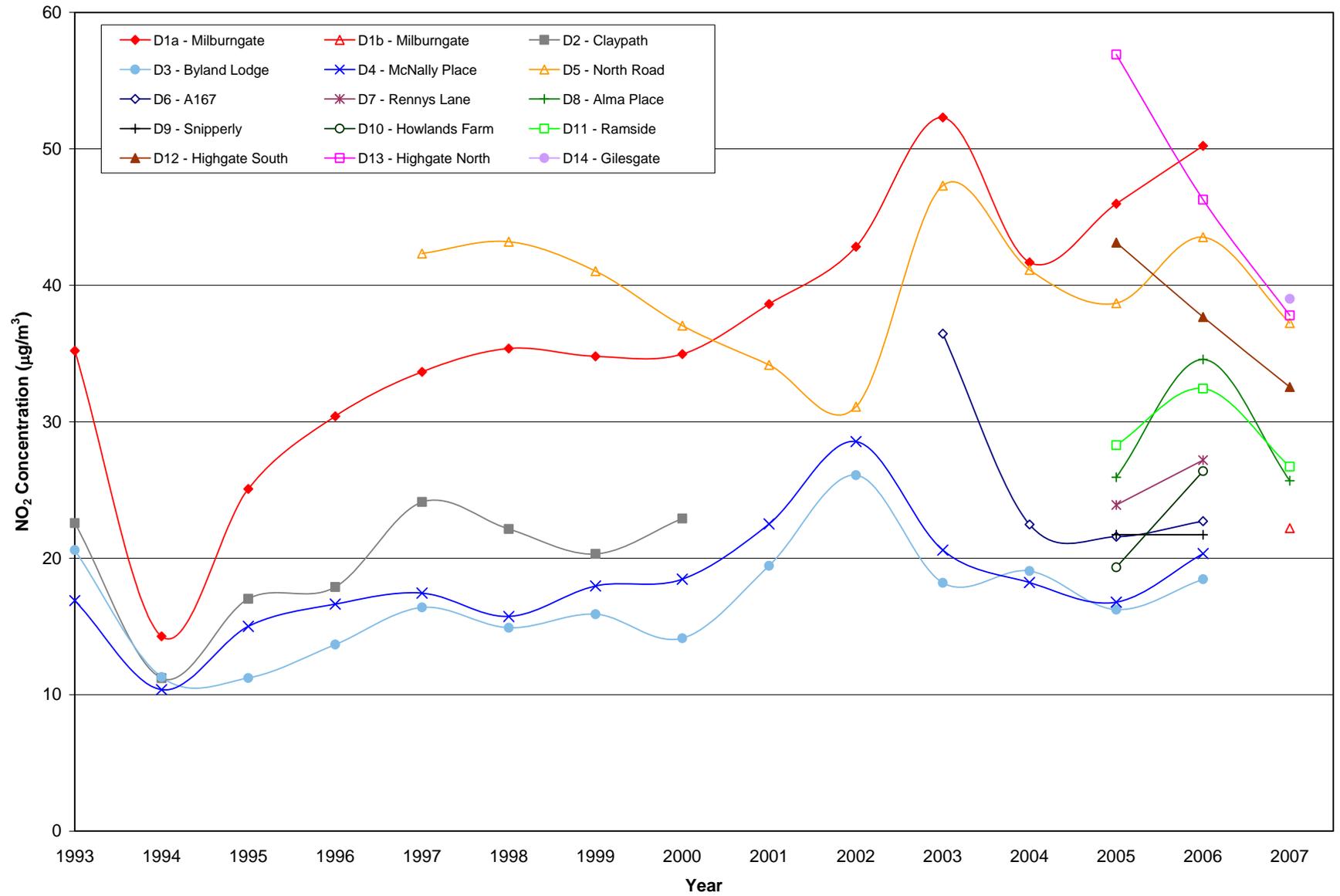
^c – monitoring ceased in March 2007;

^d – 2007 diffusion tube data scaled using a factor of 0.74, from spreadsheet version number 02/08, UWE Air Quality Review and Assessment Helpdesk Website (UWE, 2008)

^e – Milburngate diffusion tube was moved in May 2007 to (427358, 542603); sites labelled as D1a and D1b;

^f – Monitoring began May 2007. Based on 8 months' data, the annual mean values have been seasonally adjusted using urban background AURN data from North Road, Alma Place, Ramside, Highgate South and Highgate North using guidance detailed in LAQM.TG(03) Box 6.5.

Figure 1: NO₂ Diffusion Tube Monitoring Trends



2.2 New or Proposed Industrial Processes and Dust Generating Activities

Since the Updating and Screening Assessment of March 2006, no new industrial processes (Part A, A2 or B) have been permitted. No new processes are expected in the next 12 months. Similarly, no new landfill sites, quarries or other dust generating activities have been granted planning permission.

2.3 New or Proposed Developments

Three new developments are planned for the area;

- The construction of approximately 200 homes, from affordable housing to 4/5 bedroom detached houses is proposed by Miller Homes. The planning application was originally refused, however revised plans have been resubmitted (original application number 06/01116/FPA). The site was originally the location of the Framwellgate Moor Council Depot. A number of new roads are proposed with the development, including private drives. The original proposal was thought likely to result in a limited increase in traffic in the area, with possible impacts upon specific junctions. It may therefore be anticipated that the development will result in a negative air quality impact, although it is not possible to determine the effects at this stage.
- Approval has been granted for the construction of a swimming pool and leisure centre on land at Durham Sixth Form Centre, Freemans Place (planning application number 06/00212/FPA). Neither amendments to existing highways, nor additional access to highways are expected. Any increase in traffic flow in the area would likely result in a negative impact upon air quality, however, the associated removal of traffic from other areas of the city may be expected as the leisure complex replaces the existing City Baths.
- A planning application for employment use and residential development with associated play areas, landscaping, parking and access was originally refused on the site of the former Cape Asbestos Works on Durham Road, Bowburn (original application number 06/00631/OUT). Approval has now been granted on appeal. Concern has been expressed regarding a related increase in congestion on the A177. Bowburn Partnership is campaigning to have a western bypass included in the document which supercedes the Local Transport Plan 2 (LTP(2)) in 2011. It is anticipated that this bypass would relieve some of the associated congestion in Bowburn. Any increase in traffic in the area would likely result in a negative impact upon air quality.

2.4 Plans, Policies and Strategies

There have been no recent changes to the City's local air quality strategies, local planning policies, or the County's Local Transport Plan (LTP). Further information regarding the LTP, the Integrated Regional Framework, and the Regional Freight Strategy are provided below.

2.4.1 Local Transport Plan

Local Transport Plan 2 (LTP2), for the years 2006-11, has been produced by Durham County Council. The importance of air quality is highlighted as it is one of the five shared priorities of LTP2: improved accessibility and public transport, improved road safety, reduced congestion, improved air quality, and improved quality of life and health. Whilst LTP2 states that air quality does not currently pose a serious problem in the region, it does recognise that it has a critical influence over the environment of the region, particularly local and regional air quality. LTP2 discusses the need to reduce congestion to allow traffic to flow more freely, and the additional benefits this will bring for local air quality. It also recognises the need to reduce emissions to tackle climate change.

LTP2 identifies a number of transport driven initiatives that will have an impact on air quality in County Durham, such as the EAST Initiative (exploring the use of alternative fuels), encouraging the use of low emission vehicles especially for larger fleet operators, the promotion of car sharing/car pool schemes and other green travel plans, and improvements to the cycling and footpath networks. Also identified are certain opportunities to reduce traffic, such as more widespread use of tele-working, particularly in more rural areas.

There are also a number of 'daughter strategies' introduced during LTP1 (2001-2006), which are currently being reviewed, which have the potential to impact on air quality in the City: the Cycling Strategy, the Public Transport Strategy, the Walking Strategy, and the Network Management Plan.

2.4.2 *Integrated Regional Framework*

Launched by Sustainability North East (Sustaine), the Integrated Regional Framework (IRF) for the North East seeks to establish sustainable development principles at the core of the region's policies, plans and programmes. Its vision is that the "North East will be a region where present and future generations have a high quality of life, where there is an integrated approach to achieving social, economic and environmental goals; and where global responsibilities are recognised." The IRF contains 17 objectives with indicators and targets attached to each, several of which are relevant to air quality:

- Objective 5 - ensure good local air quality for all;
- Objective 7 - reduce the causes and impacts of climate change; and
- Objective 15 - ensure good accessibility for all to jobs, facilities, goods and services in the region.

Progress will be monitored with reference to sustainability indicators, such as the number of days when air pollution is moderate or high and the percentage of households within 13 minutes walk of a regular bus service.

2.4.3 *Regional Freight Strategy*

The Northern Freight Group prepared the Regional Freight Strategy (RFS). Its aims are to "promote freight interests in the North and to discuss and provide guidance on the issues affecting the movement of freight throughout the Region". The strategy contains a number of strategic objectives, the majority of which have the potential to impact upon air quality, such as Objective RD9: Assess opportunities for priority access to be given to freight vehicles. Specifically, Objective RD12 considers Local Air Quality Management, and states that the region will be reviewed with a view to determining where improvements to the efficiency of freight operations can assist in meeting air quality targets.

2.4.4 *Air Quality Action Plan*

Should an AQMA be declared it will be necessary to formulate a strategy to improve air quality in the City. The Detailed Assessment undertaken in 2007 recommended that an AQMA be declared; the Council is yet to receive comments from Defra regarding the proposal.

3 Summary

This report reviews the air quality monitoring undertaken in Durham City, including recent monitoring results from 2007. Proposed developments which may have an effect upon the air quality of the area are outlined.

The findings can be summarised as follows:

- Nitrogen dioxide was monitored at seven locations in 2007 using diffusion tubes. Annual mean concentrations were seen to fall at all sites relative to 2006 monitored values, by 5-9 $\mu\text{g}/\text{m}^3$ at D5, D8, D11, D12 and D13.
- Sites D5, D12 and D13 lie within the recommended AQMA^[8]. The annual average NO_2 objective was not exceeded at these sites, however concentrations were close to the objective at D5 and D13, and to a lesser extent D12. No declaration of this AQMA has yet been made.
- D1 at Milburngate, showed a decrease in the annual mean concentration due to the relocation of the diffusion tube in May 2007 to the new Clement's Wharf development. Whilst, it is too early to comment in detail on the impact of the change of location, the values recorded at the new location appear to be considerably lower.
- D14 at Gilesgate was installed in May 2007. Whilst, it is too early to comment in detail on the measured concentrations, particular attention should be paid to the site in the following year, due to the elevated concentrations recorded to date.
- No new Part A, A2 or B industrial processes have been granted approval;
- Three developments are expected in the area, although a quantitative assessment of the effects upon air quality cannot be estimated at this stage.
- There have been no recent changes to the City's local air quality strategies, local planning policies, or the County's Local Transport Plan (LTP).

Based on all available information it is likely that the air quality objective for NO_2 is likely to be met in Durham City, with the exception of the recommended AQMA, where the trend is uncertain. The decision as to whether to declare the AQMA is pending subject to acceptance of the Detailed Assessment by DEFRA.

4 References

- UWE (2008), *Air Quality Review and Assessment Helpdesk Website*, University of Western England, <http://www.uwe.ac.uk/aqm/review/index.html>
- Defra (2003a), *Part IV of the Environment Act 1995; Local Air Quality Management*.
- Defra (2003b), *Local Air Quality Management, Progress Report Guidance LAQM.PRG (03)*
- Defra (2003c), *Local Air Quality Management, Technical Guidance LAQM.TG (03)*
- Defra (2006), *Local Air Quality Management, Technical Guidance LAQM.TG (03) Update*
- Durham City Council (2004) *Updating & Screening Assessment*.
- Durham City Council (2005), *Air Quality Progress Report*.
- Durham City Council (2006), *Updating & Screening Assessment*.
- Durham City Council (2007), *Detailed Assessment of Air Quality*.
- Durham County Council, *Local Transport Plan 2 (LTP2), 2006-2011*.
- Sustainability Northeast, *The Integrated Regional Framework for the Northeast*
- Northern Freight Group, *North East Regional Freight Strategy*.
- The Stationery Office (2007), *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007*

Appendices

Appendix A: Air Quality Objectives

Table 2: UK Air Quality Objectives

Pollutant	Air Quality Objective		Date to be achieved by and maintained thereafter
	Concentration	Measured as	
Benzene All authorities.	16.25 µg/m ³	Running Annual Mean	31.12.2003
Benzene Authorities in England and Wales.	5.0 µg/m ³	Annual Mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running Annual Mean	31.12.2003
Carbon Monoxide	10.0 mg/m ³	Maximum Daily Running 8-hour Mean	31.12.2003
Lead	0.5 µg/m ³	Annual Mean	31.12.2004
	0.25 µg/m ³		31.12.2008
Nitrogen Dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1 Hour Mean	31.12.2005
	40 µg/m ³	Annual Mean	
Nitrogen Oxides (for the protection of vegetation)	30 µg/m ³	Annual Mean	31.12.2000
Particles (PM ₁₀) (gravimetric)	50 µg/m ³ not to be exceeded more than 35 times a year	24 Hour Mean	31.12.2004
	40 µg/m ³	Annual Mean	31.12.2004
Particles (PM _{2.5}) Exposure Reduction UK except Scotland	25 µg/m ³	Annual Mean	2020
Particles (PM _{2.5}) Exposure Reduction UK urban areas	Target of 15% reduction in concentrations at urban background ^a	Annual Mean	Between 2010 and 2020
Sulphur Dioxide	266 µg/m ³ not to be exceeded more than 35 times a year	15 Minute Mean	31.12.2005
	350 µg/m ³ not to be exceeded more than 24 times a year	1 Hour Mean	31.12.2004
	125 µg/m ³ not to be exceeded more than 3 times a year	24 Hour Mean	31.12.2004

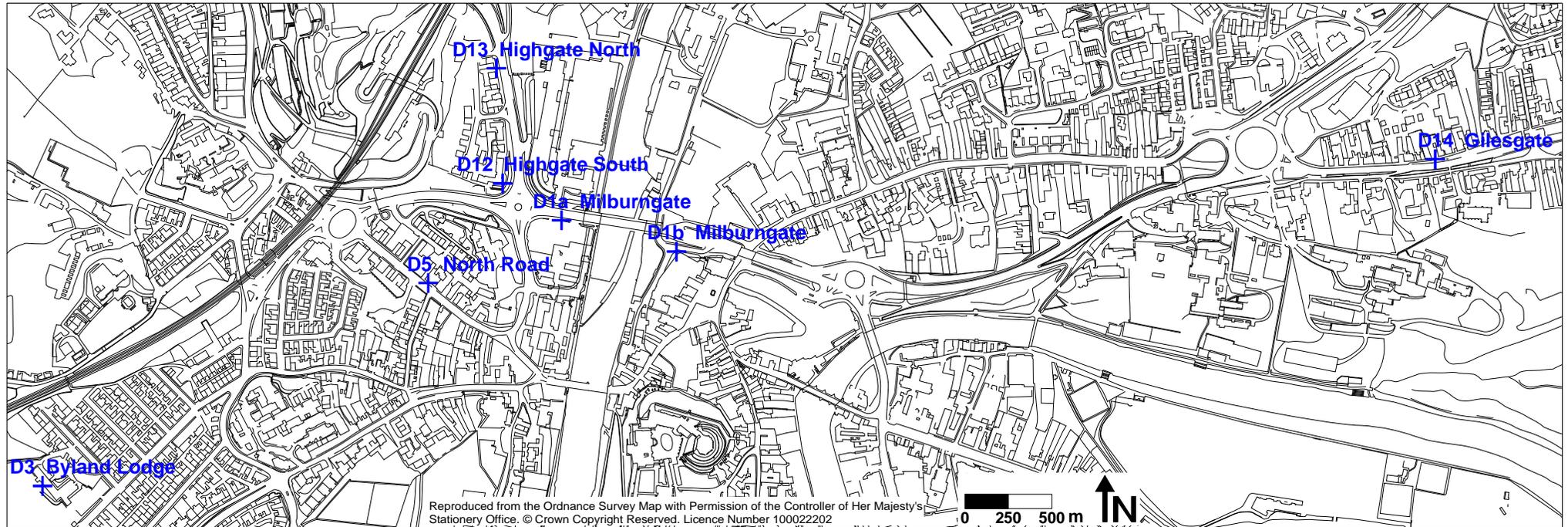
Notes: ^a 25 µg/m³ is a cap to be seen in conjunction with 15% reduction.

Table 3: EU Limit Values

Pollutant	Objective	Measured as	Date to be achieved by and maintained thereafter
Benzene	5 µg/m ³	Annual Mean	1 January 2010
Carbon Monoxide	10.0 mg/m ³	Maximum Daily 8-Hour Mean updated hourly	1 January 2005
Lead	0.5 µg/m ³	Annual Mean	1 January 2005
Nitrogen Dioxide	200 µg/m ³ not to be exceeded more than 18 times per year	1 Hour Mean	1 January 2010
	40 µg/m ³	Annual Mean	
Nitrogen Oxides (assuming as nitrogen dioxide)	30 µg/m ³	Annual Mean	19 July 2001
Ozone(Target)	120 µg/m ³ not to be exceeded more than 25 times per year	Maximum Daily Running 8-hour Mean updated hourly	1 January 2010
Particles (PM ₁₀) (gravimetric)	50 µg/m ³ not to be exceeded more than 35 times per year.	24 Hour Mean	1 January 2005
	40 µg/m ³	Annual Mean	1 January 2005
Particles (PM _{2.5}) Exposure Reduction ^a UK except Scotland	Target value 25µg/ m ³	Annual Mean	2010
Particles (PM _{2.5}) Exposure Reduction ^a UK urban areas	Target of 20% reduction in concentrations at urban background	Annual Mean	Between 2010 and 2020
Sulphur Dioxide	350 µg/m ³ not to be exceeded more than 24 times per year	1 Hour Mean	1 January 2005
	125 µg/m ³ not to be exceeded more than 3 times per year	24 Hour Mean	1 January 2005
	20 µg/m ³ (for the protection of vegetation)	Annual Mean	19 July 2001

Notes: ^a The European Directive with proposals for PM_{2.5} concentrations is currently subject to negotiation and final adoption

Figure 3: Map of Diffusion Tube Locations in Durham City Centre



Note: Diffusion tube D1 was relocated in May 2007, from site D1a to D1b.

