

2011 Air Quality Progress Report for Nottingham City Council

In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

Date July 2011

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Executive Summary

The Progress Report 2011 fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. All local authorities are required to regularly review and assess air quality in their areas, and to determine whether or not specified air quality objectives are likely to be achieved.

The air quality objectives applicable to the Local Air Quality Management process in England are set out in the Air Quality (England) Regulations 2000 (SI 928) and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043).

This report gives information about 2010 annual monitoring results and about new local developments that may impact on air quality. A brief overview is given of the Council's air quality related planning policies and climate change strategies. An update on the air quality aspects of the Local Transport Plans along with the implementation of the associated action plans has also been included.

During 2010 pollutant levels were measured, using automatic (continuous) and non-automatic monitoring, at a number of sites within the Nottingham City area.

The monitoring results showed that no exceedences of the air quality objectives for PM_{10}, sulphur dioxide, carbon monoxide and benzene were measured. The 1-hour objective for nitrogen dioxide was not exceeded.

The annual mean air quality objective for nitrogen dioxide is 40 $\mu g/m^3$; levels in excess of this were measured at the 3 roadside automatic monitoring sites and at a number of nitrogen dioxide diffusion tube sites. All but two of these locations are within the Nottingham No.2 and No.3. Air Quality Management Areas 2010.

The two diffusion tube sites of exceedence outside AQMAs are located on the façades of residential properties – one at the junction of Abbey Bridge/Castle Boulevard and the other at the Nottingham Road/Valley Road junction on the ring road. Diffusion tubes similarly sited at different locations on the ring road did not measure exceedence.

New local developments that may affect air quality mainly involve road traffic sources, for example, the Station Hub and NET (Nottingham Express Transit) Phase 2 - tram network extensions.

NET Phase 2 has the potential to impact positively on air quality by encouraging modal change from cars and reducing congestion however there could be a detrimental effect during construction. Subject to final negotiations and the contract being awarded in late summer 2011, construction work on the new lines could start by the end of the year. Passenger services across the extended tram network could be fully operational by the end of 2014.

The potential increase in the use of biomass in the industrial and domestic sector might have a negative impact on local air quality and a more detailed consideration of this may be needed in future reports.

As reported in the Progress Report 2010, Local Transport Plan 2 Air Quality Action Plan (AQAP) schemes such as Parksmart -variable message signing and zonal car park direction signing system; Big Track – off-road circular cycle route via the City Centre and; the Statutory Bus Quality Partnership have all been completed and are operational.

Current Local Transport Plan (LTP) schemes are progressing: Connecting Eastside Phase 1 – the scheme is under construction and the highway works are largely complete; the Station Hub –advanced highway and public realm improvements are underway and work on the multi-storey car park has commenced; 'Centrelink' Link Bus development – Green bus funding for electric vehicles to operate the service has been secured from the Department for Transport and the buses have been ordered.

In March 2011 Nottingham City Council introduced the third Local Transport Plan referred to as LTP 3. It is a statutory document that aims to address transport challenges facing the City of Nottingham from 2011 – 2026.

Some of schemes in the LTP2 Air Quality Action Plan have been carried through into the LTP 3 AQAP along with new measures - progress with these will continue to be reported in future Local Air Quality Management reports.

The report concludes that, as a consequence of the 2010 monitoring results, it is necessary to progress to a Detailed Assessment for annual mean nitrogen dioxide at two locations where there is relevant exposure of members of the public.

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1 Introduction

1.1 Description of Local Authority Area

The City of Nottingham covers an area of 7,470 hectares and has a population of approximately 300,800 (Key Facts, November 2010). The City boundaries contain urban residential, suburban residential, commercial and industrial areas, and an area of large suburban parkland.

Geographically the Nottingham City area is made up of the River Trent valley basin which extends outside the City's southern boundary to Rushcliffe Borough Council and southwest to Broxtowe Borough Council. Whilst to the north of the river the land rises to form a ridge running from the south west near Lenton north east to Mapperley. North and north-west of this ridge the land forms a large basin through which the River Leen flows.

Throughout the 18th and early 19th Centuries the City was dominated by the textile industry which has reduced significantly. Industry is now diverse ranging from some heavy industry through to biotechnology. Currently the Council regulates, 1 Part A2 and 72 Part B 'permitted installations' under the Pollution Prevention and Control Act 1999. There are 11 Part A1 installations permitted by the Environment Agency. The whole of the City is subject to Smoke Control Orders, the smoke control programme having been completed in 1991.

Nottingham is a major centre of commerce in the East Midlands, this together with the A453, A610 and A52 road links to the M1 and A1 results in large volumes of traffic entering the City via a number of primary arterial routes. Significant numbers of people commute into the city for work, and visit for tourism, leisure and entertainment. The city also has two universities with over 55,000 students.

The city centre is mainly retail and service sector/office use with two large shopping centres; Victoria Centre and Broadmarsh to the north and south respectively, each of which has a bus station. The centres are connected by busy pedestrianised areas. There are proposals for extensive development of both shopping centres which include moving the existing bus stations and altering road layouts.

Nottingham's railway station is located approximately 200 metres south of the Broadmarsh bus station and is undergoing major redevelopment – The Hub scheme. Proposals include a 950 place multistorey car park, the construction work for which started earlier this year.

A new concourse will also be built to enable an improved passenger interchange connecting with lines two and three of the Nottingham Express Transit tram extension proposals (NET Phase Two). The railway station work is due to be completed by 2014.

Nottingham's tram network is made up of NET Line One and NET Phase Two.

NET Line One is the first part of the network and started operating in March 2004. It links the transport centres with the northern suburbs and 'park and ride' sites providing an integrated transport system.

NET Phase Two is the collective name for the two proposed extension routes to NET Line One, currently being promoted by Nottingham City Council. The two routes that make up NET Phase Two are Clifton via Wilford, known as Line Two, and Chilwell via Queens Medical Centre (QMC) and Beeston, known as Line Three.

The Government confirmed on Thursday 24 March 2011 that funding is to be made available to enable the construction of two more tram lines.

Subject to final negotiations and the contract being awarded in late summer 2011, construction work on the new lines could start by the end of the year. Passenger services across the extended tram network could be fully operational by the end of 2014.

Both the NET Phase 2 and the redevelopment of the station have the potential to contribute to improving future air quality in the Nottingham City area.

In Nottingham City Council's area road traffic is the principal source of the air pollutants to which the Air Quality objectives cited in the Air Quality (England) Regulations 2000 (SI 928) apply. Industrial sources also contribute but to a lesser degree.

1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1 includes the number of permitted exceedences in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Table 1.2 below gives details of the previous rounds of Review and Assessment (R&A) and a brief outline of the conclusions of the reports.

Table 1.2 Previous Review and Assessment Reports

All reports are available on Nottingham City Council's internet site: http://www.nottinghamcity.gov.uk			
Title	**Date**	**Outcome**	**AQMA Declared/ Revoked?** (Date of AQMA Orders)
City of Nottingham Air Quality Review & Assessment First & Second Stage	April 2000	Third stage assessment for sulphur dioxide, nitrogen dioxide and particulates, PM_{10} necessary. No further assessment of 1,3 Butadiene, benzene, carbon monoxide and lead required.	-
City of Nottingham Air Quality Review & Assessment Second & Third Stage Report	Sept 2001	Areas of the city where unlikely to meet air quality objectives for nitrogen dioxide or sulphur dioxide. Proposed 1 AQMA for SO_2 and 2 AQMAs for NO_2	**Declared** AQMA No:1 (Sulphur dioxide) (2002) AQMA No:2 (Nitrogen dioxide) (2002) AQMA No:3 (Nitrogen dioxide) (2002)
City of Nottingham Local Air Quality Management Stage Four Review & Assessment of Nottingham's Air Quality Management Areas	July 2003	Determined that AQOs for sulphur dioxide – hospital chimney and nitrogen dioxide – traffic sources, unlikely to be exceeded by 'due dates' therefore no Air Quality Action Plans needed	-
City of Nottingham Local Air Quality Management Updating and Screening Assessment	October 2003	Necessary to proceed to a Detailed Review and Assessment for nitrogen dioxide with respect to a number of roads and for sulphur dioxide in the vicinity of the Nottingham Main-line Station.	-

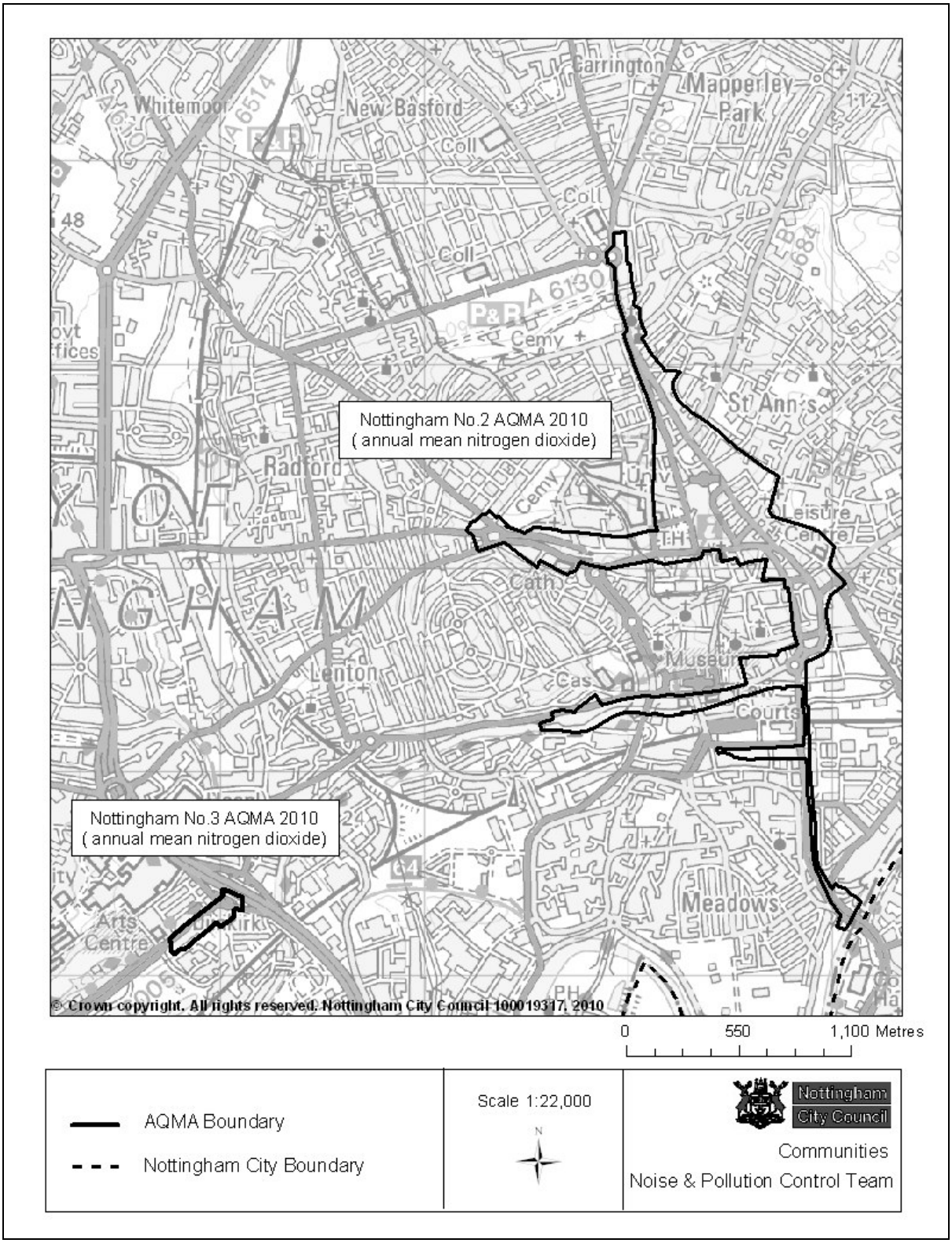
All reports are available on Nottingham City Council's internet site: http://www.nottinghamcity.gov.uk			
Title	**Date**	**Outcome**	**AQMA Declared/ Revoked?** (Date of AQMA Orders)
City of Nottingham Local Air Quality Management Detailed Assessment	August 2004	Sulphur dioxide 15-minute mean AQO likely to be met at locations of 'relevant exposure' at Nottingham Mainline Station. Nitrogen dioxide annual mean AQO likely to be met. Concluded insufficient monitoring data available to allow revocation of any of the AQMAs.	-
City of Nottingham Local Air Quality Management Progress Report	April 2005	Concluded that SO_2 monitoring data sufficient to propose revocation of AQMA No:1 (Sulphur dioxide). Necessary to maintain AQMAs No 2 & 3 (nitrogen dioxide)	-
Nottingham City Council Local Air Quality Management Updating and Screening Assessment:	June 2006	Necessary to proceed to a Detailed Assessment for PM_{10} for 2 roads in the city centre and for nitrogen dioxide for a number of roads and junctions based on guidance criteria and some diffusion tube data. AQMA No:1 (Sulphur dioxide) to be revoked - agreed by Defra	**Revoked** AQMA No:1 2002 (Sulphur dioxide) (5 April 2007)
Nottingham City Council Local Air Quality Management Detailed Assessment Consultation Document	May 2008	Conclusion that no further action required for PM_{10} - accepted by Defra **Proposed amendments to existing AQMAs No.2 & No.3 for nitrogen dioxide.** **Further work for nitrogen dioxide being undertaken following comment and assessment by Defra** (see DA 2008 – Annex 1 below)	-

All reports are available on Nottingham City Council's internet site: http://www.nottinghamcity.gov.uk			
Title	**Date**	**Outcome**	**AQMA Declared/ Revoked?** (Date of AQMA Orders)
Nottingham City Council Local Air Quality Management Progress Report	July 2008	Concluded that there was no need to undertake a further detailed assessment - accepted by Defra	-
2009 Air Quality Updating and Screening Assessment for Nottingham City Council	April 2009	Concluded that there was no need to undertake an additional detailed assessment because all areas of potential exceedence are being considered in the revised DA May 2008 - accepted by Defra	
Nottingham City Council Local Air Quality Management Detailed Assessment 2008 Annex 1 - Supplementary Information for Nitrogen Dioxide	October 2009	Confirmed the DA May 2008 findings - **need for amended AQMAs for annual mean NO_2.** Accepted by Defra on 31 December 2009. Consultation and declaration of amended AQMAs to be completed by 30 April 2010	-
Nottingham City Council Local Air Quality Management Detailed Assessment 2009	January 2010	For clarification this is a consolidated report of DA May 2008 PM_{10} findings and DA 2008 Annex 1 NO_2 findings. Outcomes are as for the individual reports given above	**Declared** AQMA No:2 2010 (nitrogen dioxide) AQMA No:3 2010 (nitrogen dioxide) By AQMA Variation Orders dated 22 June 2010
2010 Air Quality Progress Report for Nottingham City Council	October 2010	Concluded that there was no need to undertake a detailed assessment for any of the regulated pollutants - accepted by Defra	-

AQMA=Air Quality Management Area AQO=Air Quality Objective DA= Detailed Assessment NO_2 = nitrogen dioxide SO_2 = sulphur dioxide PM_{10} = particles

Nottingham AQMAs No.2 and No.3 2010 are shown on Figure 1.1.

Figure 1.1 Map of Air Quality Management Areas Boundaries



The Orders for Nottingham No.2 and No.3 AQMAs 2010 were sealed on 22 June 2010. Therefore in accordance with Section 84(1) of the Environment Act 1995 the Council is required to undertake a Further Assessment (FA) within 12 months of the designation of the AQMAs i.e. by 21 June 2011.

Currently minimal progress has been made in the preparation of a FA but the intention is to have the report ready for consultation by the end of August 2011.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Nottingham City Council undertakes continuous automatic monitoring at a number of locations in its area and Defra have an Automatic Urban and Rural Network (AURN) site in the city centre. Figure 2.1 is a map showing the locations of the continuous monitoring sites.

AURN, Clinton Street East, City Centre

The AURN station is located in the city centre and classified as an 'Urban Background' (previously 'Urban Centre') site. The surrounding area comprises retail outlets and city centre business premises in an urban pedestrianised area. The nearest road, the A6008, approximately 30 metres from the site, is no longer a major through-route following completion of the City Centre Major Scheme to divert and redirect traffic around the City Centre and limit access to certain vehicles types such as buses. Relevant exposure is at residential properties approximately 40 metres to the south and approximately 23 metres to the north east of the site.

The monitoring equipment is housed in a self-contained, air-conditioned fixed unit; the manifold inlet is approximately 3 metres high and has continuous automatic analysers that measure nitric oxide (NO), nitrogen dioxide (NO_2), oxides of nitrogen (NOx), particles ($PM_{2.5}$), sulphur dioxide (SO_2) and ozone (O_3). Benzene is measured using continuous pumped diffusion tubes.

Particles, PM_{10} were measured from site initiation in 1996 until December 2008. No measurements were undertaken in 2009 however PM_{10} measurement was re-started in 2010.

Carter Gate NOx (CG NOx), Carter Gate, City Centre

This unit has been located at Carter Gate monitoring NOx since December 2003 and monitoring SO_2 between May 2007 and December 2009. The site is a suburban mixed commercial/residential area of the City adjacent to the A60. It is approximately 10 metres from the A60 which is a major traffic route and, approximately 3 metres from a busy B road. It is classed as a 'Roadside' site. There are residential properties approximately 12 metres from the unit and 8 metres away from the A60.

The sampling inlet for the self-contained, air-conditioned enclosure is approximately 2.5 metres high. NO, NO_2 and NOx are measured using a continuous automatic analyser.

Lace Street NOx (LS NOx), Lace Street, Dunkirk

This is a fixed unit located at Lace Street since March 2007. The site is a suburban, mixed commercial/residential area of the City adjacent to the A6005, a busy road traffic route. It is approximately 4 metres from the A6005 and 1 metre from a minor road and is

classed as a 'Roadside' site. The unit is sited on the pavement at the boundary with a residential property.

The sampling inlet for the self-contained, air-conditioned enclosure is approximately 1.5 metres high. NO, NO_2 and NOx are measured using a continuous automatic analyser.

New Monitoring Site

St Andrews Road NOx (SA NOx), Off Mansfield Road, City Centre

This site was established in June 2010 following the expansion of Nottingham City Council's Air Quality Management Area No.2. The monitoring unit is located on a small residential street - St Andrews Road, approximately 13 metres from A60 Mansfield Road. The A60 is a major traffic route into and out of the north of the City.

The SA NOx is a fixed unit sited on the pavement at the boundary of a residential property. It is classed as a 'Roadside' site.

The sampling inlet for the self-contained, air-conditioned enclosure is approximately 1.7 metres high. NO, NO_2 and NOx are measured using a continuous automatic analyser.

Details of quality assurance and quality control (QA/QC) for the automatic monitoring sites are given in Appendix C.

Monitoring Site Closure

Air Quality Monitoring Station (AQMS), Queens Medical Centre (QMC), Clifton Boulevard, Dunkirk

This station which monitored a number of pollutants was located at the QMC in March 2002 as a consequence of the initial round of Review and Assessment with nitrogen dioxide being the main pollutant of concern.

The decision was taken to decommission the site at the end of 2009 because between 2004 and 2009 annual mean nitrogen dioxide levels were 34 - 36 $\mu g/m^3$; no exceedences of any of the AQOs have been measured since 2004 and; as a consequence of the variation to AQMA No.3 the Queens Medical Centre and its surrounds are no longer in the AQMA.

Figure 2.1 Map showing 2010 Automatic Monitoring Sites

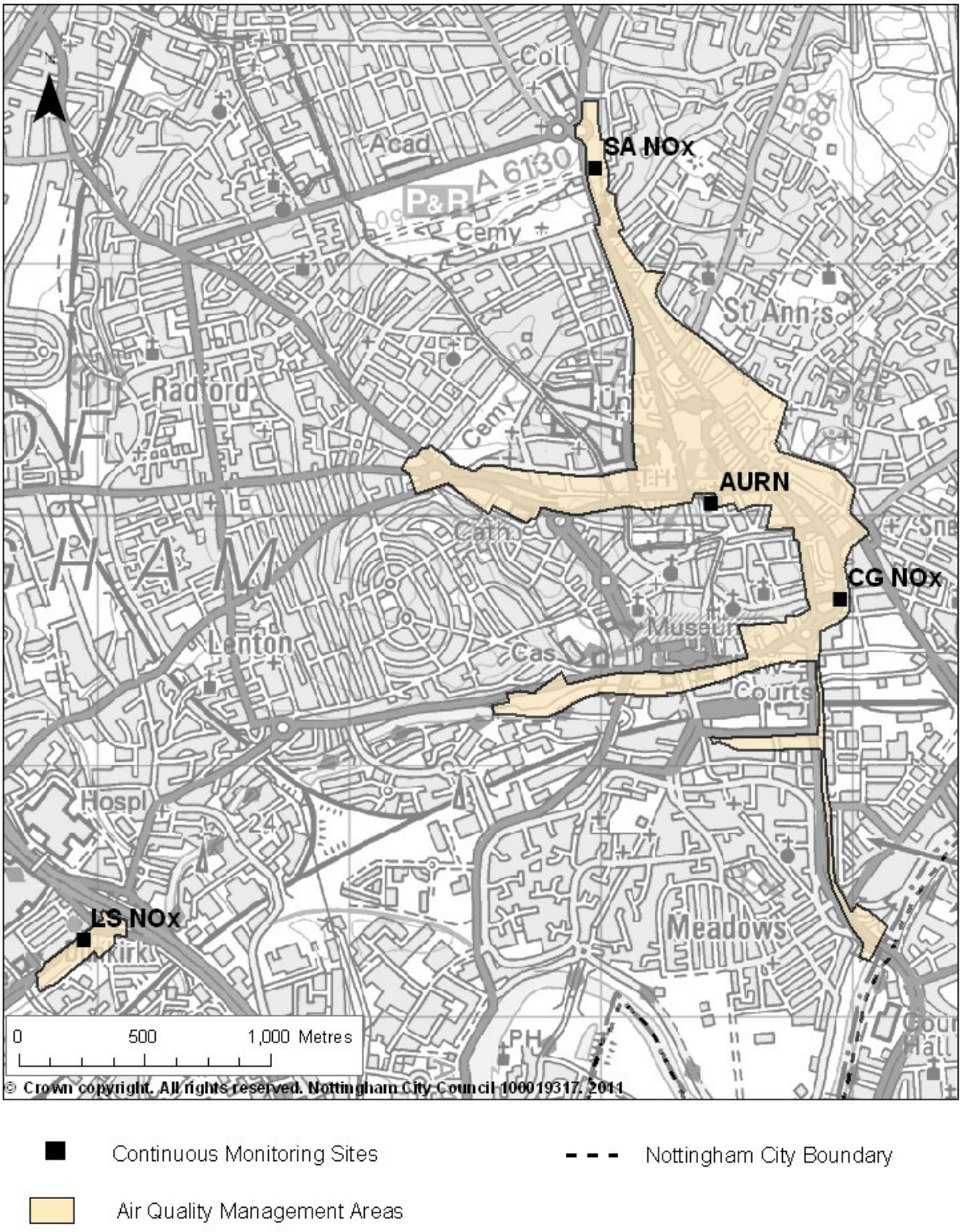


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road	Does this location represent worst-case exposure?
AURN Clinton St East.	Urban Background	X 457437	Y340049	$PM_{2.5}$	FDMS	N	Y (0m)	35m	N
				PM_{10}	FDMS				
				NO_2, NO, NOx,	Chemi-luminescence				
				O_3	Ultra Violet Absorption (UVA)				
				SO_2	Ultra Violet Fluorescence (UVF)				
CG NOx Carter Gate	Roadside	X 457946	Y339668	NO_2, NO, NOx,	Chemi-luminescence	Y	Y (12m)	4m	Y
LS NOx Lace St.	Roadside	X 454941	Y338315	NO_2, NO, NOx,	Chemi-luminescence	Y	Y (0m)	9m (main rd.) 1m (minor rd.)	Y
SA NOx St Andrews Rd	Roadside	X 456967	Y341382	NO_2, NO, NOx,	Chemi-luminescence	Y	Y (0m)	13m (main rd.) 2m (minor rd.)	Y

2.1.2 Non-Automatic Monitoring

Nitrogen Dioxide (NO_2) Diffusion Tube Monitoring

Nottingham City has diffusion tubes sited at a number of locations and are shown on the map - Figure 2.2. During 2010 diffusion tubes were placed within and near AQMAs No.2 and 3 and in other areas where there may be 'hot spots' due to road and/or traffic changes. They were also co-located with continuous monitors at the AURN, CG NOx and LS NOx sites.

The majority of the tubes were placed on building façades of residential properties at sites classified as 'roadside'; three sites are 'urban background'. The tubes are exposed for a month before being sent for laboratory analysis by Gradko International, Hampshire. The laboratory is United Kingdom Accreditation Service (UKAS) accredited; is assessed annually for compliance to ISO 17025 and participates in a number of proficiency schemes.

See Appendices B and C for:

- details of the tube type and the laboratory that supplies and analyses the tubes
- details of the bias adjustment factor that has been applied to the annual mean NO_2 diffusion tube data.
- details of Nottingham City Council's diffusion tube and continuous monitoring 2010 co-location study including comparison with the reference method.
- details of diffusion tube QA/QC.

Benzene Pumped Tube Monitoring

Benzene is measured at the AURN, as part of the Non-Automatic Hydrocarbon Network, using a controlled flow pumped tube sampler.

The 2 tubes are changed every two weeks and returned to ESG, Bretby for analysis.

The equipment is audited twice a year by AEA, Oxfordshire. The sample flow is calibrated and adjusted as required; the system is leak checked and preventative maintenance performed.

The geographical location of the AURN site is shown in Figure 2.1.

Figure 2.2 Map showing Diffusion Tube Monitoring Sites

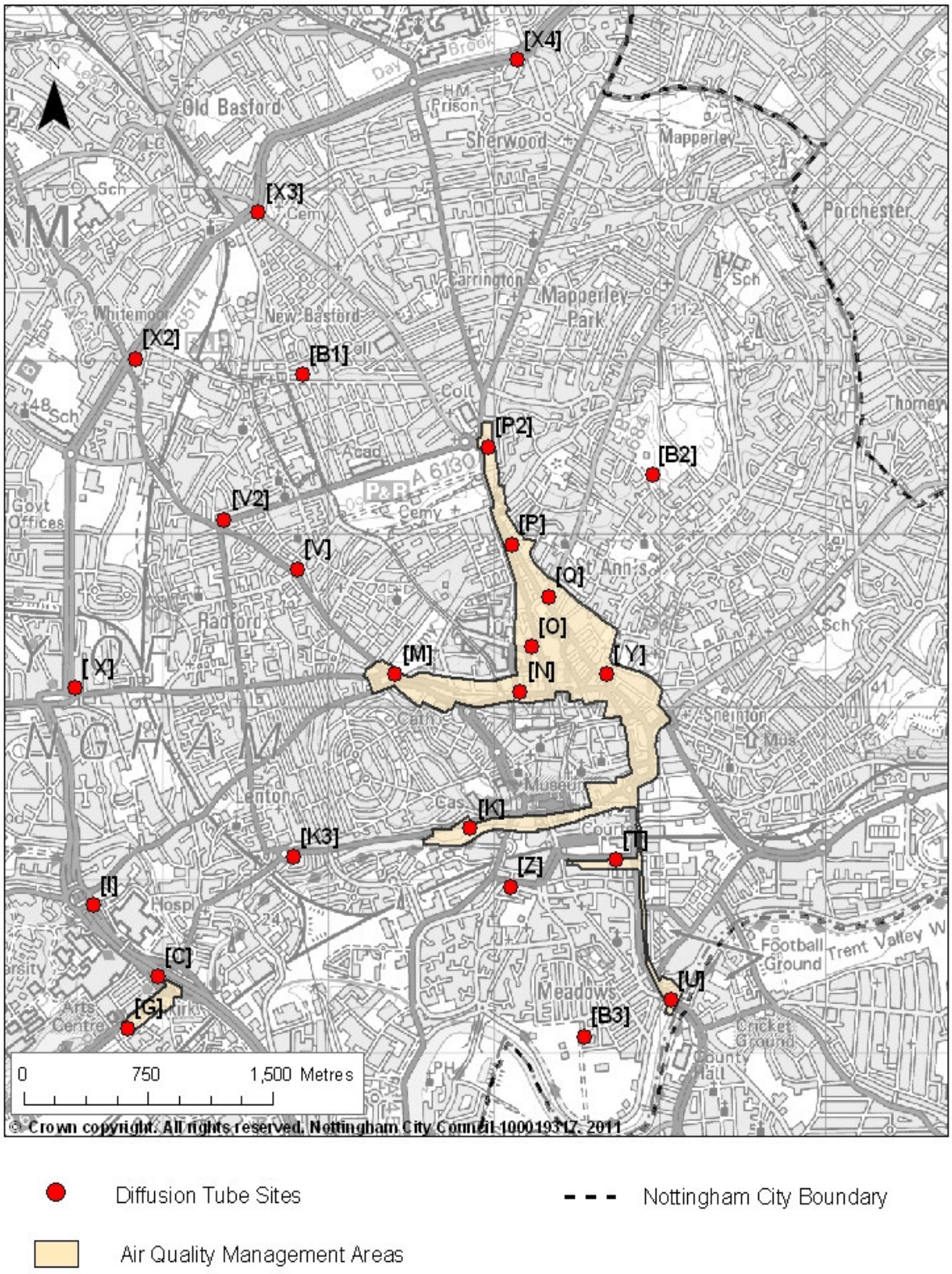


Table 2.2 Details of Non-Automatic Monitoring Sites

Site Id & Street		Site Type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road	Worst-case Location?
Diffusion Tubes									
C	Clifton Boulevard	R	X454963	Y338447	NO_2	N	Y (0m)	13m	Y
G	Beeston Road	R	X454782	Y338146	NO_2	Y	Y (0m)	9m	Y
I	Derby Road	R	X454577	Y338860	NO_2	N	Y (0m)	25m	Y
X	Western Blvd	R	X454466	Y340111	NO_2	N	Y (0m)	16m	Y
X2	Wilkinson St	R	X455823	Y341993	NO_2	N	Y (0m)	18m	Y
X3	Nottingham Rd	R	X455573	Y342860	NO_2	N	Y (0m)	8m	Y
X4	Danethorpe Vale	R	X457250	Y343815	NO_2	N	Y (0m)	15m	Y
V2	Gregory Blvd	R	X455358	Y341086	NO_2	N	Y (0m)	10m	Y
K	Castle Boulevard	R	X456852	Y339303	NO_2	Y	Y (0m)	4m	Y
K2	Castle Blvd (2)	R	X455769	Y339137	NO_2	N	Y (0m)	3m	Y
V	Bentinck Rd	R	X455808	Y340799	NO_2	N	Y (0m)	6m	Y
M	Canning Terrace	R	X456399	Y340191	NO_2	Y	Y (0m)	4m	Y
N	Up. Parliament. St	R	X457154	Y340095	NO_2	Y	Y (0m)	4m	Y
O	Shakespeare St	R	X457221	Y340351	NO_2	Y	Y (0m)	2m	Y
P	Mansfield Road	R	X457103	Y340944	NO_2	Y	Y (0m)	4m	Y
P2	Mansfield Road (2)	R	X456961	Y341507	NO_2	Y	Y (0m)	16m	Y
Q	Woodborough Rd	R	X457329	Y340643	NO_2	Y	Y (0m)	2m	Y
Y	Beck Street	R	X457673	Y340194	NO_2	Y	Y (0m)	3m	Y
T	Queen's Road	R	X457729	Y339122	NO_2	Y	Y (0m)	2m	Y
Z	Kinglake Place	R	X457089	Y338966	NO_2	N	Y (0m)	4m	Y
U	Trent Bridge	R	X458051	Y338328	NO_2	Y	Y (0m)	5m	Y

Site Name		Site Type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road	Worst-case Location?
Diffusion Tubes									
B1	Elson St	UB	X455839	Y341925	NO_2	N	N	4m	N
B2	Hungerhill Rd	UB	X457957	Y341333	NO_2	N	N	33m	N
B3	River View	UB	X457578	Y338091	NO_2	N	Y (0m)	3m	N
Other Non-automatic Monitoring									
AURN Clinton St East		UB	X457437	Y340049	Benzene Dark Smoke	N	Y (0m)	35m	N
Site Types: R = roadside UB= urban background									

2.2 Comparison of Monitoring Results with Air Quality Objectives

Nottingham City Council's 2010 automatic and non-automatic monitoring data are given in subsections 2.2.1 to 2.2.5 inclusive. Comparison with relevant Air Quality Objectives (AQOs) has been made and where the relevant AQO has been exceeded the figure is highlighted in bold type.

2.2.1 Nitrogen Dioxide

Information is given for both continuous and diffusion tube 2010 nitrogen dioxide monitoring results. There were exceedences of the annual mean AQO since measured annual mean NO_2 concentrations were greater than 40µg/m^{-3} at three automatic sites and eleven diffusion tube sites - two of which are not in the existing AQMAs.

The results also show that the 1-hour AQO was not exceeded at any site, 1-hour means above 200µg/m^3 were recorded on only two occasions at each of two continuous sites and there were no diffusion tube concentrations greater than 60µg/m^3.

Automatic Monitoring Data

CG NOx and SA NOx sites are located in the Nottingham No.2 AQMA 2010 whilst LS NOx is within the Nottingham No.3 AQMA 2010. These three continuous monitoring stations are close to residential properties and all were initiated as a result of previous rounds of Review & Assessment.

In 2010 the nitrogen dioxide annual mean AQO concentration of 40µg/m^3 was exceeded at the CG NOx, LS NOx and SA NOx roadside sites - see Table 2.3a. In the table concentrations are highlighted in bold type where the AQO has been exceeded when the figures are rounded to an integer.

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA 2010?	Data Capture for full calendar year 2010 %	Annual mean concentrations (µg/m^3)		
				2008	2009	2010
AURN	Clinton Street East	N	98.6	33	34.5	40.0
CG NOx	Carter Gate	Y	98.5	**43.5**	40.4	**43.3**
LS NOx	Lace Street	Y	99.7	**41.5**	39.8	**40.9**
SA NOx*	St Andrews Road	Y	41.9	-	-	**46.8**

1 January 2010 – 31December 2010 ratified data

* Station established June 2010 – data capture for 5 months monitoring period = 94.9%. Data annualised as per LAQM guidance TG (09) Box 3.2 see Appendix A.

Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Automatic Monitoring Sites - Figures 2.3 A – C

The trends in annual mean nitrogen dioxide levels for those automatic sites with more than 5 years of data i.e. AURN and CG NOx are shown in Figures 2.3 A – B. The trend lines shown on each graph were drawn using the Microsoft Excel spreadsheet package.

Figure 2.3 A shows that at the AURN the overall trend has been decreasing annual mean NO_2 concentrations for the 12 years that it has been operational. However the most noticeable decrease was between 1998 and 2000.

Between 2001 and 2009 nitrogen dioxide levels have been relatively steady with minor year on year variations with concentrations no greater than 36µg/m^3. The 2010 value represents a significant increase in the annual mean concentration. It is unlikely to be due to local changes such as increased traffic or congestion but possibly can be attributed to the extreme meteorological conditions that occurred in the last few months of 2010.

The Leicester Centre, Sheffield Centre and Leeds Centre AURN stations also measured increased NO_2 concentrations compared with last year. This is demonstrated in Figure 2.3 C which shows 2006 – 2010 annual mean NO_2 levels at Nottingham Centre and the above sites. The increase between 2009 and 2010 was largest at the Leicester Centre site.

All four of the sites are classified as 'Urban Background'.

Figure 2.3A

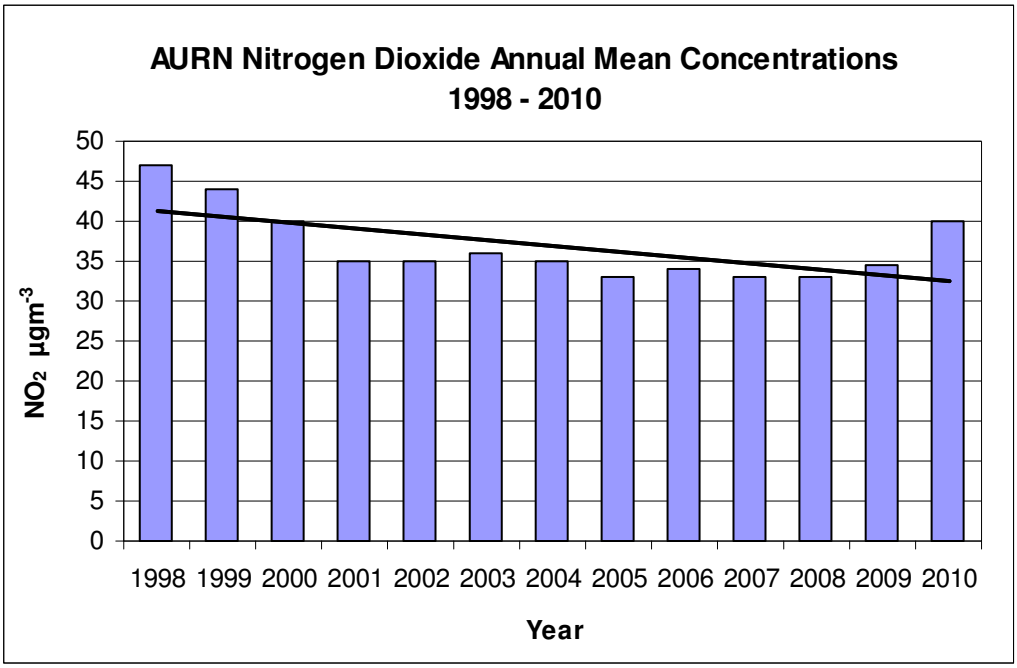


Figure 2.3 B - at the CG NOx roadside site the overall trend shows increasing annual mean nitrogen dioxide concentrations that slightly exceed the annual mean NO_2

AQO. This is probably indicative of increasing road traffic levels and contrasts with the trend at the AURN which is an urban background site. Also unlike the AURN the 2010 annual mean was similar to some of the previous years.

Figure 2.3 B

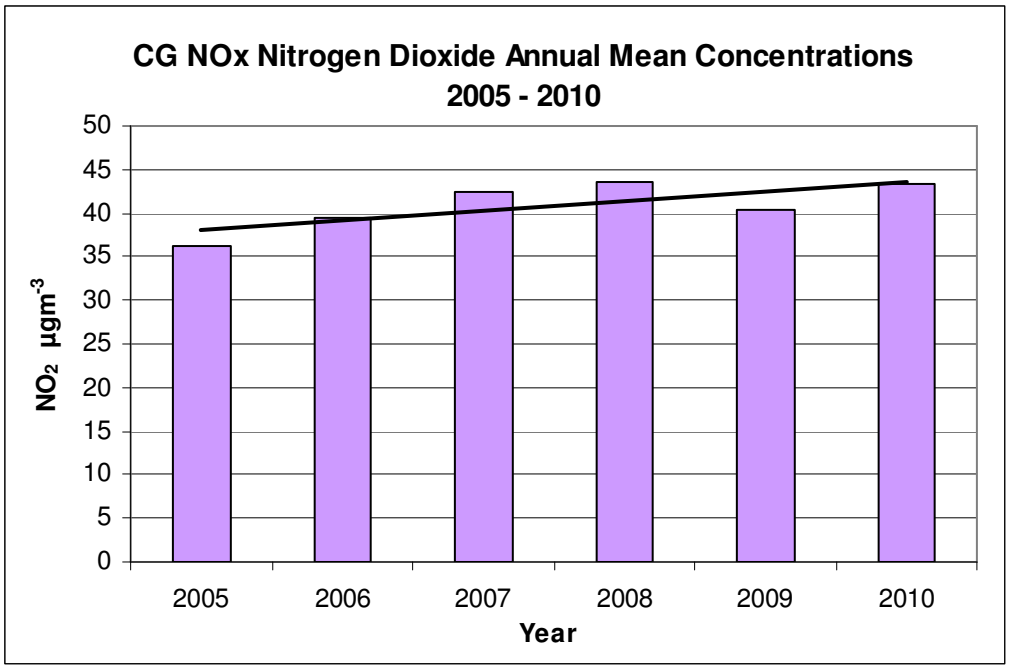
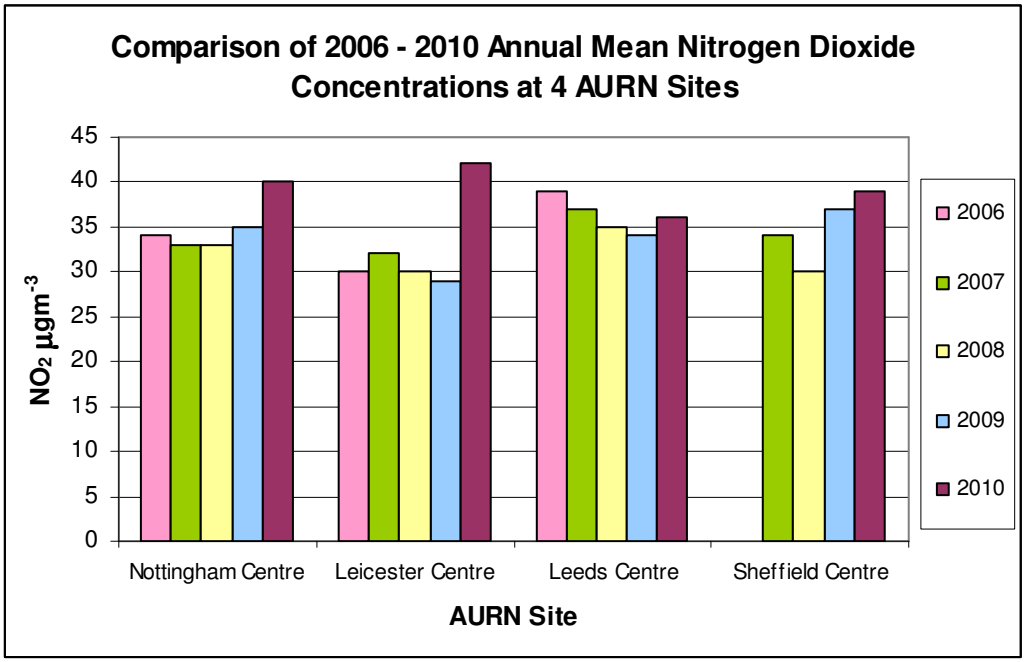


Figure 2.3 C



No exceedences of the 1-hour AQO were recorded in 2010 at any of Nottingham City's monitoring sites – see Table 2.3b.

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site Id	Location	Within AQMA 2010?	Data Capture for full calendar year 2010 %	Number of Exceedences of hourly mean (200 µg/m^3) (99.8th percentile of hourly means)		
				2008	2009	2010
AURN	Clinton Street East	N	98.7	6	0	2
CG NOx	Carter Gate	Y	98.5	0	0	0
LS NOx	Lace Street	Y	99.7	4	0	2
SA NOx*	St Andrews Road	Y	41.9	-	-	0 (145.8)

1 January 2010 – 31 December 2010 ratified data

* Station established June 2010 – data capture for 5 months monitoring period = 94.9%. Data annualised as per LAQM guidance TG(09) Box 3.2 see Appendix A.

Diffusion Tube Monitoring Data

The annual mean NO_2 AQO was exceeded at 11 diffusion tube sites. The data is shown in Table 2.4 and exceedences of the AQO are highlighted in bold type. The 2 rows that are shaded highlight sites i.e. X3 and K3 where exceedences of the annual mean AQO were measured and which are not within AQMAs.

While all the sites with Site Id 'X' prefixes are located on residential properties adjacent to the outer ring road only X3 – Nottingham Road measured an exceedence of the AQO. This is located at a junction where a busy local traffic route and the outer ring road cross.

The other site K3, where exceedence outside an AQMA was measured, is close to a heavily trafficked roundabout on a residential/commercial building that is currently unoccupied.

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA 2010?	Data Capture 2010 %	2010 Annual mean concentrations NO_2 (µg/m^3) Bias Adjusted
C	Clifton Boulevard	N	83.3	36
G	Beeston Road	Y	100	**42**
I	Derby Road	N	100	34
X	Western Boulevard	N	100	34
X2	Wilkinson Street	N	100	35
X3	Nottingham Road	N	100	**42**
X4	Danethorpe Vale	N	83.3	33
V2	Gregory Boulevard	N	100	33
K	Castle Blvd.	Y	100	**43**
K3	The Grove Castle Blvd.	N	83.3	**48**
V	Bentinck Road	N	100	37
M	Canning Terrace	Y	100	**55**
N	Upper Parliament St.	Y	100	**52**
O	Shakespeare St.	Y	100	**50**
P	Mansfield Road	Y	100	**51**
P2	Mansfield Road (2)	Y	100	39
Q	Woodborough Road	Y	100	**49**
Y	Beck Street	Y	91.7	**50**
T	Queen's Road	Y	100	**53**
Z	Kinglake Place	N	100	34
U	Trent Bridge	Y	100	33
B1	Elson Street	N	91.7	28
B2	Hungerhill Road	N	83.3	24
B3	River View	N	75	29

1 January 2010 – 31 December 2010

Single tubes were located at the above sites.

The bias adjustment factor applied = 0.95. Further information about the adjustment factor is given in Appendix B and the raw data for the monthly values are shown in Appendix D Table D-1.

Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites.

Figure 2.4 shows trends at 4 diffusion tube sites, within AQMAs, where measurements have been made for least five years. It is apparent that trends vary at individual sites:

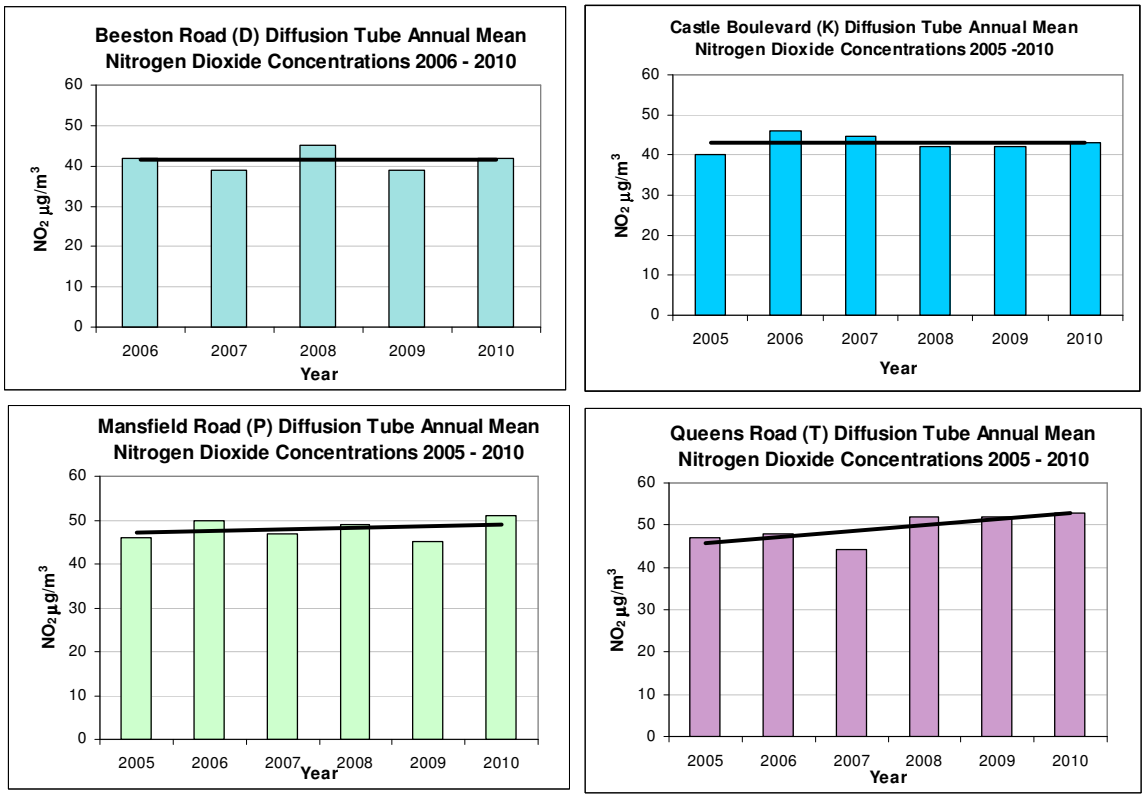
- Beeston Rd (D) levels have been similar for the last five years and have been either just below or slightly above the AQO concentration

- Castle Boulevard (K) the concentrations of nitrogen dioxide have reduced compared with 2006/2007 but have levelled out since then. They continue to exceed the AQO.

- Mansfield Road (P) the trend is slightly upwards with a noticeable increase in annual mean nitrogen dioxide compared with 2009.

- Queens Road (T) shows increasing nitrogen dioxide concentrations. Other than a city centre site this location record the highest 2010 annual mean concentration. Long term works have been carried out in the vicinity which may have contributed to traffic congestion and hence to an increase in nitrogen dioxide levels.

Figure 2.4



The graphs also show that at two of the sites (D and P) 2010 nitrogen dioxide levels were higher than last year whilst the 2009 and 2010 levels were similar at the other two sites.

2.2.2 PM_{10}

At AURN, the only site at which PM_{10} is measured in Nottingham City area, the annual mean and 24-hour mean PM_{10} gravimetric equivalent concentrations for the site are given in Tables 2.5a and 2.5b below. The data show that the annual mean and 24 hour mean PM_{10} AQOs were not exceeded in 2010.

Table 2.5a Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA 2010?	Data Capture for full calendar year 2010 %	Annual mean concentrations (µg/m^3) PM_{10} TEOM FDMS 2010
AURN	Clinton Street East	N	89.9	23.1

12 months data 01/01/2010 to 31/12/2010 ratified data

Table 2.5b Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA 2010?	Data Capture 2009 %	Number of exceedences of daily mean objective (50 µg/m^3) 2010
AURN	Clinton Street East	N	89.9	12

12 months data 01/01/2010 to 31/12/2010 ratified data

Table 2.5c Results of $PM_{2.5}$ Automatic Monitoring

$PM_{2.5}$ monitoring at AURN was initiated in 2009 and the 2010 results are given in the table - currently there are no LAQM AQOs for this pollutant.

Site ID	Location	Within AQMA?	Data Capture for full calendar year 2010 %	Annual mean concentrations (µg/m^3) $PM_{2.5}$ TEOM FDMS 2010	Number of times the daily mean >= 50 µg/m^3 2010
AURN	Clinton St East	N	75.1*	16	5

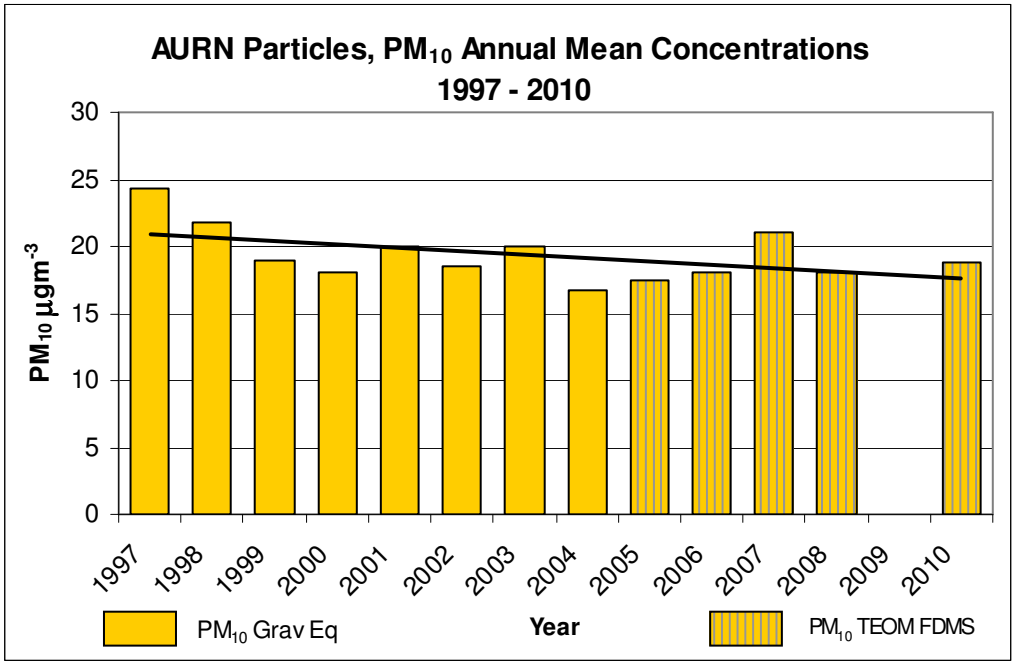
12 months data 01/01/2010 to 31/12/2010 ratified data

PM_{10} Trend Data

Figure 2.5 shows the PM_{10} trend data for the AURN. The values show gravimetric equivalent PM_{10} annual mean concentrations with a distinction between the gravimetric adjustment used prior to 2005 and TEOM FDMS correction used since then.

Whilst there is an overall downward trend, PM_{10} levels have increased and decreased since 2005 but at no time have they approached 40µg/m^3 - the annual mean AQO.

Figure 2.5



2.2.3 Sulphur Dioxide

Sulphur dioxide was monitored at the AURN during 2010. No exceedences of any of the objectives were recorded and levels were low.

Table 2.6 Results of SO_2 Automatic Monitoring: Comparison with Objectives

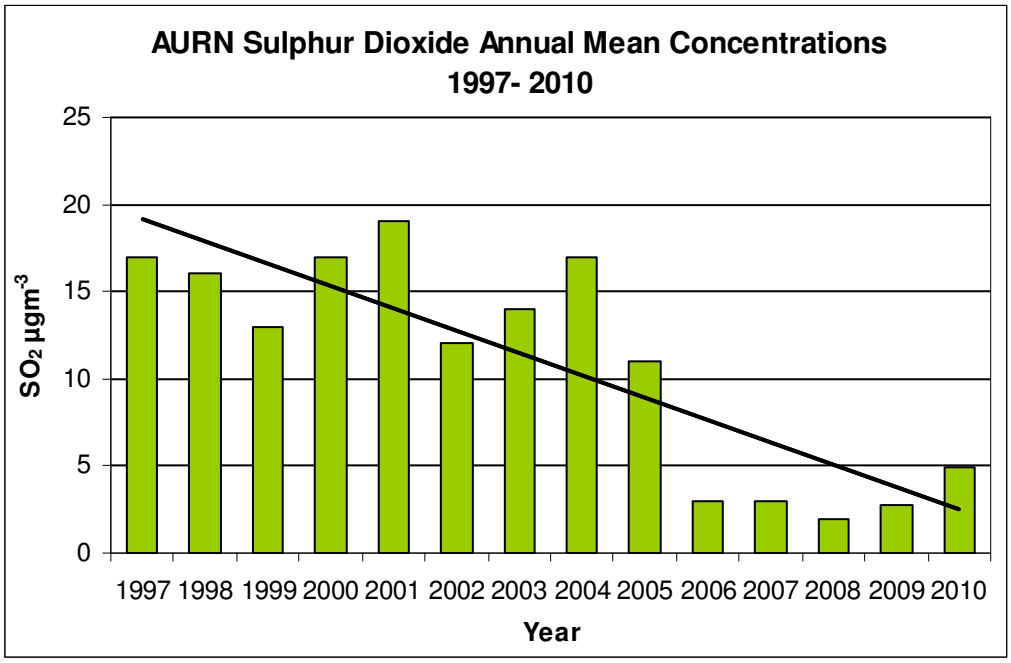
Site ID	Location	Within AQMA?	Data Capture 2010 %	Number of Exceedences of:		
				15-minute Objective (266 µg/m^3)	1-hour Objective (350 µg/m^3)	24-hour Objective (125 µg/m^3)
AURN	Clinton Street E	N	96.9	0	0	0

12 months ratified data 1 January 2010 – 31 December 2010

Sulphur Dioxide Trend Data

Figure 2.6 shows that the trend has been decreasing annual mean sulphur dioxide concentrations. As noted in the PR2010 the significant decrease in levels since 2006 is likely to be due to the completion of the Turning Point North traffic scheme. The 2010 level is a significant increase compared with the last 4 years and may be due to the extreme weather conditions in the last few months of the year.

Figure 2.6



2.2.4 Benzene

2010 benzene levels at the AURN were low. Whilst running means cannot be measured using the pumped diffusion tube methodology the results show that it is highly unlikely that the benzene AQ objectives were exceeded.

Table 2.7 Results of Benzene Pumped Tube Monitoring: Annual Mean

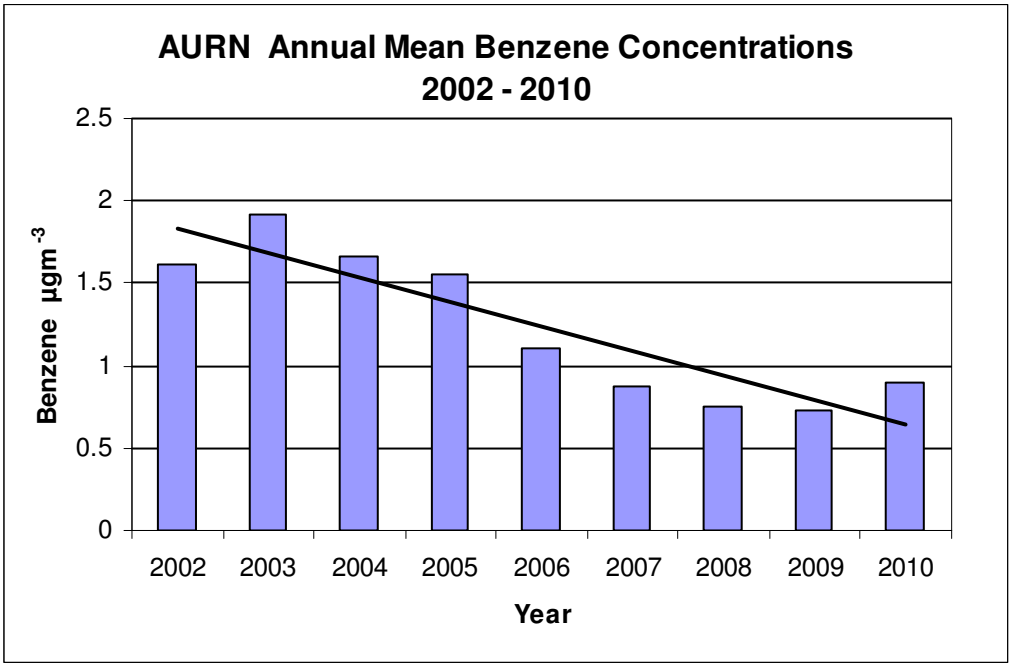
Site ID	Location	Within AQMA?	Data Capture 2010 %	2010 Annual mean concentration Benzene (µg/m^3)
AURN	Clinton Street East	N	95.5	0.9

12 months ratified data – 01/01/2010 to 31/12/2010

Benzene Trend Data

Figure 2.7 shows that there is a general downward trend in measured levels of benzene at this site but that there was an increase in 2010. Whilst concentrations have been low throughout there is a noticeable reduction that is evident from 2006 onwards. This coincides with the implementation of the Turning Point North traffic management scheme.

Figure 2.7



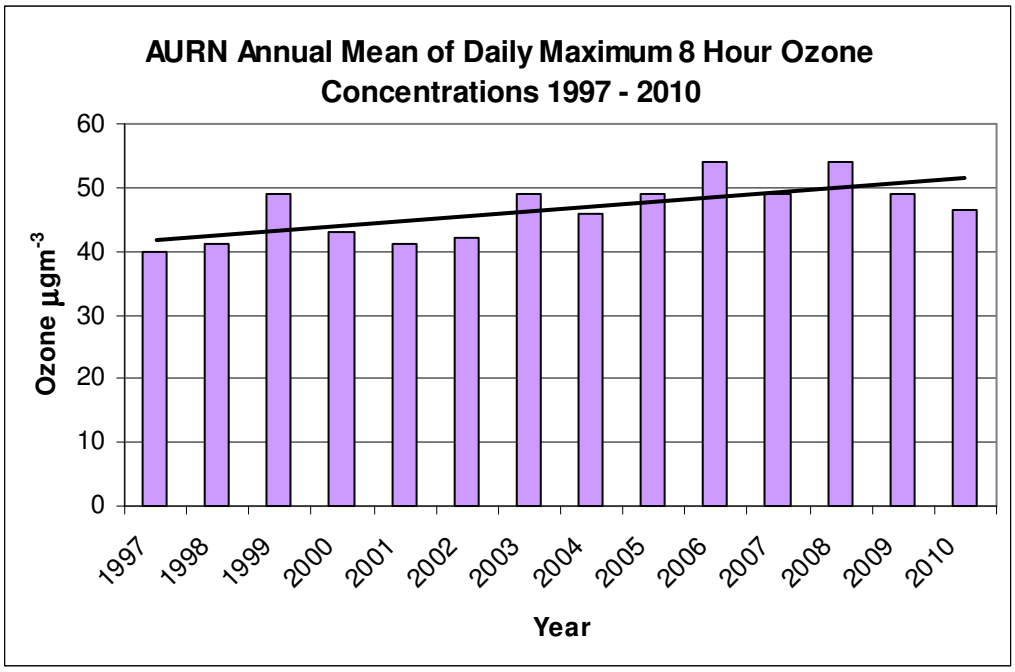
2.2.5 Other pollutants monitored

Ozone

Ozone has been monitored at the AURN since 1997. The trend for the daily maximum 8 hour yearly data at this site is shown in Figure 2.8. It can be seen that the highest value of 54µg/m^3 was measured at the AURN in 2006 and 2008.

At the AURN the general trend shows increasing ozone levels between 1997 and 2006 however from 2008 to 2010 there have been noticeable year on year decreases - this is consistent with national data for urban background sites.

Figure 2.8


AURN Annual Mean of Daily Maximum 8 Hour Ozone Concentrations 1997 - 2010
Ozone µgm-3
60
50
40
30
20
10
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

2.2.6 Summary of Compliance with AQS Objectives

Nottingham City Council has measured concentrations of nitrogen dioxide above the annual mean objective at relevant locations outside of the AQMAs, and **will need to proceed to a Detailed Assessment**, for two areas:

- around the junction of the Outer Ring Road (A6514) with Nottingham Road (B682) which is in a residential/commercial area approximately 3.5km to the north west of the City centre

  and

- in the vicinity of the roundabout where Castle Boulevard (A6005) meets Abbey Bridge (A6005) - a mainly residential area approximately 1.7km west of the City centre.

3 New Local Developments

The following have been considered for possible new local developments that may affect air quality:

- Road Traffic Sources – see 3.1 below
- Other Transport Sources – none identified
- Industrial Sources – see 3.2 below
- Commercial and Domestic Sources – see 3.3 below
- New Developments with Fugitive or Uncontrolled Sources – none identified

3.1 Road Traffic Sources

3.1.1 Local Transport Plan Implementation Plan 2011 - 2014

The Local Transport Plan Implementation Plan 2011 – 2014 which is part of Nottingham City Council's Local Transport Plan 3: 2011 - 2026 (LTP3) identifies a number of major schemes, each of which if implemented could affect air quality in the City area:

Station Hub Redevelopment

Nottingham's railway station is undergoing major redevelopment – The Hub scheme. Proposals include a 950 place multi-storey car park, the construction work for which started earlier this year. The new car park, which is the first significant phase of the redevelopment, is being built on the western end of the existing surface station car parking area on Queen's Road adjacent to part of the City Centre AQMA No.2 2010.

A new concourse will also be built to enable an improved passenger interchange connecting with lines two and three of the Nottingham Express Transit tram extension proposals (NET Phase Two). The railway station work is due to be completed by 2014.

Nottingham Express Transit (NET) Phase Two

Nottingham's tram network is made up of NET Line One and NET Phase Two.

NET Line One is the first part of the network and started operating in March 2004. It runs between Hucknall and Nottingham city centre as far as the railway station, with a spur to Phoenix Park, just off junction 26 of the M1 motorway. The line links the transport centres with the northern suburbs and 'park and ride' sites providing an integrated transport system.

NET Phase Two is the collective name for the two proposed extension routes to NET Line One, currently being promoted by Nottingham City Council. The two routes that make up NET Phase Two are Clifton via Wilford, known as Line Two, and Chilwell via Queens Medical Centre (QMC) and Beeston, known as Line Three.

The Government confirmed on Thursday 24 March 2011 that funding is to be made available to enable the construction of two more tram lines.

Subject to final negotiations and the contract being awarded in late summer 2011, construction work on the new lines could start by the end of the year. Passenger services across the extended tram network could be fully operational by the end of 2014.

Ring Road Major Scheme

Proposals for the Nottingham Ring Road Integrated Major Transport Scheme have been developed to meet national, regional and local planning and transport objectives, to mitigate local problems and improve the local transport network, providing the capacity for growth in the conurbation.

Its key objectives are to improve bus reliability and journey times and to make the Ring Road a more attractive route for cross-city trips thereby reducing traffic in the City Centre to complement the Turning Point Projects major scheme (Turning Point North was completed in 2006). The scheme will provide orbital and radial capacity improvements, enhanced interchange opportunities, integration with NET and improvements for pedestrians and cyclists including upgraded street lighting.

The scheme may have a positive impact on air quality through congestion reduction and reduction of traffic in the City Centre.

A business case for the £30 million scheme has been submitted for assessment to the Department for Transport in a bid for major scheme funding.

Broad Marsh/Turning Point South

Westfield the current operator and developer of the Broad Marsh shopping centre in the south of the city have re-submitted their planning application (originally consent was given in 2004) for a major re-development of the centre including a new bus station and a multi-storey car park. Work is ongoing with the developer to update the required transport assessment in support of the application.

Further information relating to LTP3 is given in Section 6 below.

3.1.2 Turning Point East

The Turning Point East scheme will bring the east side of the city closer into the centre by making Huntingdon Street and Lower Parliament Street into a logical two way route for traffic heading north and south through the city. It will mirror the north/ south route on the west side of the city along Maid Marian Way.

Bellar Gate, which serves the National Ice Centre from Hockley and the rest of the city, will form part of a new direct route for traffic wanting to access the centre.

Parts of the scheme have already been implemented and it is expected to be completed in its entirety this year. It is difficult to determine whether there will be significant changes in traffic flows and whether the scheme will positively or

negatively affect air quality. This will be looked as part of the Updating and Screening Assessment (USA) 2012.

3.2 Industrial Sources

A supermarket development that includes a new petrol filling station is currently under construction in Bulwell to the north of the city.

3.3 Commercial and Domestic Sources

Since the PR 2010 a small number of new wood burning biomass boiler installations have been identified - none need to be regulated under the Pollution Prevention and Control Act 1999. The burners are mainly for new school buildings or associated with new commercial premises and consequently air quality assessments have been or will be undertaken as part of the planning consultation process.

From the reports that have been submitted over the past 2 years none of the biomass installations are likely to have a significant adverse impact on air quality either singly or in combination since they are spatially separated.

Limited information is available about the use of biomass burners in domestic premises but in the Nottingham City area it appears to be low – the few that have come to Environmental Health's attention, have mainly been as a result of complaints of smoke/odour nuisance.

Nottingham City Council is of the opinion that the current level of domestic biomass combustion is so low that it can be considered that there is no significant impact on the City's air quality. This conclusion will be kept under review.

Nottingham City Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

- Station Hub Redevelopment

- Nottingham Express Transit (NET) Phase Two

- Ring Road Major Scheme

- Broad Marsh/Turning Point South including a new bus station

- Turning Point East Traffic Scheme

- A new petrol filling station in Bulwell

These will be taken into consideration in the next Updating and Screening Assessment, scheduled for 2012.

4 Local / Regional Air Quality Strategy

Nottingham City Council is a member and currently chair of the Nottinghamshire Environmental Protection Working Group and a signatory to the Nottinghamshire Air Quality Strategy revised 2008 (the Strategy) entitled 'A Breath Of Fresh Air for Nottinghamshire - An Air Quality Improvement Strategy for the Next Decade'.

The Strategy was prepared by a partnership of Nottinghamshire Local Authorities, the Environment Agency, the Health Protection Agency and the Highways Agency It is designed to help local authorities and partner organisations manage and improve ambient air quality and to protect the health and wellbeing of the public in a co-ordinated and integrated manner. It considers actions that will be taken and should be supported in a number of sectors:-

- Public sector e.g. facilitate meetings of Nottinghamshire AQ Steering Group, review on a local basis and when practical reduce emissions to air from their own activities

- Transport e.g. use air quality targets in Local Transport Plans, restricted vehicular access where appropriate

- Planning and land use e.g. ensure AQ is a material consideration when assessing planning applications, develop and implement procedures for consultation with neighbouring Councils where deterioration in AQ is predicted

- Health and education e.g. work with Primary Care Trusts, HPA and others to raise awareness about poor air quality, the health effects etc.

- Energy efficiency e.g. review energy usage and put in place initiatives to improve energy efficiency where appropriate

- Industrial and commercial e.g. rigorously enforce legislation to control emissions of air pollutants, assist and advise businesses in complying with relevant legislation

- Climate change and global warming e.g. reduce CO_2 emissions caused by energy use in Council buildings, purchase low carbon green electricity

- Domestic sector e.g. encourage reduction and recycling of household waste, encourage domestic households to remove polluting appliances

Nottingham City Council has implemented and continues to implement a significant proportion of the actions recommended within the Strategy.

The Strategy may be viewed at:

http://www.nottinghamcity.gov.uk/CHttpHandler.ashx?id=2382&p=0

It is proposed to review the Strategy in 2015.

5 Air Quality Planning Policies

5.1 The 'Saved' Nottingham Local Plan 2005

The Nottingham Local Plan (adopted November 2005) is the current Statutory Local Plan for the City of Nottingham and provides the basis for decisions related to land use planning.

The Nottingham Local Plan was produced as part of the old planning system and will be 'saved' until it is replaced by the emerging Local Development Framework – further information given below.

Specific policies in the Local Plan that reference air quality can be found in Section 9 – Natural Environment:

Trees Protected by Tree Preservation Orders

NE6: Planning permission for development involving the cutting down, topping, lopping or uprooting of any tree protected by a Tree Preservation Order will not be granted unless, in the opinion of the City Council, it is necessary for valid arboricultural reasons, or for the satisfactory development of the site. Where such consent is granted, replacement planting will be required to offset loss of visual and natural amenity.

9.18 The City Council recognises the importance of trees in the City not only for the contribution they make to improving air quality, by acting as filters to pollution, but also their contribution to nature conservation, amenity and townscape.

Pollution

NE9: Planning permission will not be granted for development which would generate pollutants that would cause significant detriment to the users of the development, users of the adjoining land, or the environment; or where the level of existing pollutants would be a danger to users of the proposed development.

9.25 Planning Policy Statement 23 (PPS23) Planning and Pollution Control, stresses the importance of focussing on any potential for pollution which may affect the current and future uses of land. It includes details of the legislative controls outside the planning system which apply to air and water quality. Policy NE9 is in general conformity with PPS23.

9.26 Pollution in the form of air pollutants, noise or light can be prejudicial to human health and to the natural environment or can cause nuisance. It is therefore important to consider the risks and reduce unnecessary dangers arising from increased exposure to pollution.

9.27 Careful design, siting and landscaping can help to reduce the impact of pollution. Planning permission may be granted, where appropriate, subject to

conditions to ensure the effects of pollution are minimised to an acceptable level or as regulated by legislation.

Role of the Local Plan

10.4 The Local Plan will ensure that the LTP policies and programmes are carried through in terms of spatial, land use and development matters. It will provide the integration between land use planning and planning for transport.

10.5 It provides a policy framework for implementing the key strategies of the LTP, to safeguard land where appropriate to achieve detailed proposals in those documents. The application of planning policy will be a key mechanism in delivering long-term travel demand management and in ensuring progress towards the LTP targets and objectives.

10.6 Strategic policy ST4 emphasises the importance of the Local Plan in supporting and implementing the policies of the LTP.

10.7 The objectives of the LTP which the Local Plan will support include:

h) To relieve communities from the adverse effects of through traffic, particularly heavy goods vehicles.

j) To improve air quality within the Plan area and to alleviate other transport impacts upon health.

The Nottingham Local Plan 2005 can be viewed at

http://www.nottinghamcity.gov.uk/CHttpHandler.ashx?id=536&p=0

5.2 Supplementary Planning Guidance (SPG)

SPGs were produced under the old Local Plan system to expand on the policies in the Local Plan. These SPGs could be considered as a 'material' consideration in determining planning applications.

The following SPGs have specific reference to air quality:

- Design Guide for Industrial, Commercial and Retail Development - this advises that the location of air pollution sources next to public open spaces should be avoided.

- Nottingham City Centre Pavement Cafes – this identifies that in certain parts of the city centre the quality of air from traffic fumes makes it inappropriate to site pavement cafés and the city council will not issue a license under such conditions. In other areas, consideration does need to be given to the proximity of bus stops and taxi ranks, not only from the aspect of air quality but also taking into account movement clusters of vehicles and people.

The SPG documents can be viewed at:

http://www.nottinghamcity.gov.uk/index.aspx?articleid=717

5.3 Local Development Framework (LDF)

The LDF is made up of Local Development Documents which set out what will be built in Nottingham in the future.

Nottingham's Local Development Framework (LDF) will be comprised of:

- Local Development Documents (LDDs), which include:
  1. Development Plan Documents (DPDs) which are part of the statutory development plan, and
  2. Supplementary Planning Documents (SPDs) which expand policies set out in DDS or provide additional detail
- Statement of Community Involvement (SCI)
- Local Development Scheme (LDS)
- Annual Monitoring Report (AMR)

Local Development Framework - Development Plan Diagram

The diagram on this page highlights the documents currently involved in local planning policy.



LDF -Core Strategy

The Core Strategy sets out the long-term spatial vision for the whole of the Nottingham City Council area. It includes policies for delivering the strategy and a key diagram; as well as general criteria-based policies for assessing all planning applications. This is a Development Plan Document (DPD) and will be subject to independent examination.

Greater Nottingham Aligned Core Strategies

- The Nottingham City Council's Core Strategy is being prepared in partnership with the surrounding Borough and District Councils in Greater Nottingham
- This will ensure that the future development of Greater Nottingham is planned in a consistent and comprehensive way

LDF - Land and Planning Policies (LAPP) Development Plan Document

This Development Plan Document combines two documents that were formally known as 'Site Specific Land Allocations and Policies DPD' and 'Generic Development Control Policies DPD'.

- This is a Development Plan Document (DPD) which is separate from the Core Strategy.
- It allows the City Council to update allocations in light of changes in other Local Development documents or implementation on the ground.
- Sites should be identified following a robust and credible assessment of the suitability, availability and accessibility of land for particular uses or a mixture of uses.

LDF - Area Action Plans

An Area Action Plan (AAP) is a Development Plan Document focused upon a specific location or an area subject to conservation or significant change.

- The AAP could include a major regeneration project or a growth area.
- It should focus on implementation, providing an important mechanism for ensuring development of an appropriate scale, mix and quality for key areas of opportunity, change or conservation.
- It should outline protection for areas sensitive to change and aim to resolve conflicting objectives in areas subject to development pressures.
- AAPs are subject to independent examination.

There are no current plans within the Local Development Scheme (LDS) to produce any Area Action Plans.

LDF - Statement of Community Involvement

The Statement of Community Involvement (SCI) sets out Nottingham City Council's policy for involving communities when the Council are preparing and revising planning documents and considering applications for planning permission.

The aim of the SCI is to get more people involved in planning, at an early stage, so they can have a more meaningful input into planning decisions.

LDF - Local Development Scheme

The Local Development Scheme (LDS) is the project plan for the Local Development Framework (LDF). It sets out the timetable of when Local Development Documents will be prepared. The City Council keep the programme set out in the LDS under review and reports progress in the Annual Monitoring Report.

Information on the Local Development Framework and associated documents can be found at the following link:

http://www.nottinghamcity.gov.uk/index.aspx?articleid=740

LDF - Supplementary Planning

Supplementary planning documents provide additional detail to the policies contained in the Nottingham Local Plan 2005 or Development Plan Documents. They are a 'material' consideration when planning applications are decided.

- Supplementary Planning Guidance has been replaced by statutory Supplementary Planning Documents (SPD).
- Existing SPG will continue to supplement 'saved' Local Plan policies until these are replaced by documents within the LDF.
- Therefore the SPGs will continue to be a material consideration in the determination of planning applications until they are revised or replaced as part of the LDF.

Relevant Documents

Supplementary Planning Guidance (SPG)
Nottingham City Council has produced a wide variety of guidance on various planning issues.

- The extent to which a proposed development complies or conflicts with Supplementary Planning Guidance is an important consideration when making decisions on applications for planning permission.

Supplementary Planning Documents (SPDs)

- These may take the form of design guides, area development briefs, a master plan or issue-based documents.
- These documents can use illustrations, text and practical examples to expand on how the authority's policies can be taken forward.
- The City Council will involve the community in the preparation of SPDs.
- They are also subject to a Sustainability Appraisal to ensure economic, environmental and social effects of the plan are in line with sustainable development targets.

Interim Planning Guidance

- Nottingham City Council has produced Interim Guidance documents for specific policy areas to cover the transitional period before the adoption of the Core Strategy.
- These documents provide guidance on the application and interpretation of existing and emerging policy.

Development Briefs

- These documents provide site and area-specific advice and guidance to inform proposals for the future development of various sites around the city.
- They are an important consideration when determining planning applications relating to those sites.
- These documents were produced as part of the old planning system and may be converted into SPDs during preparation and continual updating of the Local Development Framework.

6 Local Transport Plans and Strategies

6.1 Local Transport Plan 3: 2011- 2026

Nottingham Local Transport Plan

Nottingham City Council have introduced the third Local Transport Plan (LTP) which is a statutory document that aims to address transport challenges facing the City of Nottingham from 2011 - 2026 and is referred to as LTP3.

With plans to transform our railway station into a transport hub, an extended world class tram system, and a fantastic bus network that has two award winning bus operators, Nottingham is one of the leading cities in the UK for public transport.

Public transport is important to us as it affects our everyday life, and with a likely future increase in demand, we need to plan ahead. Although funding is limited at the moment, it is essential we continue to invest in our public transport system if our economy is to continue to grow and we are to do more to improve the environment.

The LTP has been developed to comprise of two component documents:

- **LTP Strategy 2011 - 2026** which sets out the Council's long term transport ambitions and strategy of proposals
- **LTP Implementation Plan 2011 - 2014** details the funding allocations and proposed transport measures to be funded over the next three years from April 2011 to March 2014

LTP documents can be downloaded from

http://www.mynottingham.gov.uk/index.aspx?articleid=12631

LTP 3 Integrated Impact Assessment

As part of the development of the Local Transport Plan, the City Council has conducted an Integrated Impact Assessment of the Plan. The following is an extract from it:

‘**Appendix 1**

Nottingham Local Transport Plan 3 Integrated Impact Assessment

Review of policies, programmes and strategies

This Appendix summarises the relevant policies, programmes, plans and strategies reviewed for LTP3 in accordance with the guidance on Strategic Environmental Assessment (SEA). This forms part of the baseline dataset and has been used to develop the objectives which have been used to assess the LTP strategy options.

A wide range of documents were considered under the following SEA themes: Air Quality; Biodiversity; Climate/CO_2; Cultural Heritage; Human Health; Landscape/ Townscape; Material Assets; Population/Economy; Soil; Waste; and Water.'

The Integrated Impact Assessment (IIA) also addresses the requirements for Equality Impact and Health Impact Assessments.

The full report for the LTP3 Integrated Impact Assessment and Environmental Statement is also available for download at the link given above.

See Section 8 for information relating to the implementation and progress of action plans

7 Climate Change Strategies

7.1 Climate Change

10:10 Campaign

Nottingham City Council has signed up to the 10:10 campaign. This is encouraging all sectors in the UK to reduce their carbon emissions by 10% in 2010. We are committed to cutting our carbon by 10%.

Everyone is being encouraged to take part with initiatives on Nottingham City Council's website such as:

It's Everybody's Business - do your 10% be cleaner and greener

Maybe you want to cut your carbon emissions by 10% in 2010, to join 10:10, please click here to visit the 10:10 campaign webpage.

Carbon Footprinting

Do you know your carbon footprint? To calculate your carbon footprint please click here to visit our carbon footprinting pages.

ZERO 2100 Climate Protection Strategy

In 2006 ZER0 2100 a climate protection strategy was produced. This built on the earlier Climate Change action plan. The aims of this strategy are:

- to put the city on a path towards a low carbon future where the needs of the economy and local people are much less dependent on fossil fuels resulting in lowered carbon emissions.
- to ensure that the city is adapted to the inevitable impacts of climate change and is well placed to maximize any benefits.

The Council are now beginning to work on a new climate change plan for the city.

The Nottingham Declaration

The Nottingham Declaration on Climate Change requires councils and public authorities to acknowledge the increasing impact that climate change will have on our community during the 21st century and commits them to tackle the causes and effects of a changing climate in their area of operation. Further information including the content of the declaration can be found by clicking here to visit the Nottingham Declaration on Climate Change website.

Working in Partnership

Nottingham's local strategic partnership in 2008 adopted two National Performance indicators relating to climate change. These are called National Indicator 186 - per

capita reduction in CO2 emissions in the Local Authority area and National Indicator 188 Planning to adapt to Climate Change.

The Health and Environment Partnership

The Nottingham Health and Environment Partnership was launched in March 2007. It is a multi-sector partnership that works strategically in Greater Nottingham to identify and address environmental and economic causes of ill-health, to promote good health, tackle health inequalities and encourage environmental responsibility.

Nottingham Carbon Club

Nottingham is aiming to become one of the UK's First Low-Carbon cities through reducing emissions, raising environmental standards and capturing any economic benefits. In April 2007 the Nottingham Carbon Club was launched. Its main purpose is to assist Nottingham's major businesses help meet the City's commitments to lower carbon emissions.

The Carbon Management Programme

Nottingham City Council is participating in the Carbon Trust Local Authority Carbon Management Programme and is committed to reducing its carbon footprint through this process. This targets carbon reduction in the Council's own buildings, transport, estate, schools and housing functions.

The Council's Carbon Management Plan can be downloaded from the website.

Environmental Management

The development of the Eco-Management & Audit Scheme (EMAS) throughout Nottingham City Council will strengthen action taken to reduce the City's significant environmental impacts. By ensuring that the environmental impacts of all services are audited, monitored and actions taken to ensure continual improvement in this area.

Environmental Policy

Nottingham City Council recognises the need to safeguard and enhance the local and global environment through its own activities and those of our partners. This Local Authority is committed to minimising the Council's adverse environmental impacts while enhancing the quality of life for the people of Nottingham City. An Environmental Policy was adopted in 2008 to outline how we intend to do this.

7.2 The Nottingham 2020 Sustainable Energy Strategy

The Nottingham Sustainable Energy Strategy was produced by Nottingham Energy Partnership (NEP) on behalf of Nottingham City Council.

The Strategy provides an overarching framework for the City's plans, programmes and initiatives relating to sustainable energy supply and use to 2020: cutting emissions, maintaining energy security, maximising economic opportunities, and protecting the most vulnerable. The Strategy and the associated action plan will

ensure that Nottingham accelerates the development, use and value of its energy resource and energy efficiency potential.

Targets

The Action Plan prioritises the delivery of:

- A 26% reduction of carbon dioxide emissions against 2005 levels,
- 20% of the City's own energy generated from low or zero carbon sources by the target date of 2020, as set out in the local Sustainable Community Strategy.

At a national level the Government's Low Carbon Transition Plan and Renewable Energy Strategy in particular provide very challenging targets. The Strategy details how we will meet our proportional 'pro rata per capita' contribution to the national Renewable Energy Strategy targets, which is estimated in the City at:

- 2% (37GWh) generation from small scale sources
- 12% (342.7GWh) generation from renewable heat sources

Nottingham's Current Status

Nottingham is starting the low carbon transition from the front, with a considerable lead. Between 2003 and 2006 the City reduced domestic gas consumption by 16%; the greatest fall of all Local Authorities in the East Midlands and of all the Core Cities. In 2006 we generated 3% of our own heat and power from renewables and waste, making Nottingham the most energy self-sufficient City in the UK

We also generated 11.45% of our own heat and power from gas CHP (combined heat and power) and renewables. Nottingham is the leading City in the country in distributed energy generation. Generation of 11.45% of our own energy from low or zero carbon sources, against the 20% Sustainable Communities Strategy target is a remarkable achievement and a very strong starting point for the challenge ahead.

Key Actions

To meet the national and local targets for heat and power will be very challenging, even given Nottingham's leading position. This will require the development of all the City's major renewable and low carbon energy resources from large scale biomass to a rapid increase in the uptake of domestic renewable energy systems.

The Action Plan alongside in the Energy Strategy represents a detailed map to achieve our local and national 2020 targets. National targets for small scale electricity generation and renewable heat steer us towards biomass fuel and renewable electricity generation.

In particular, to meet national and local targets for heat and power will require;

- More than doubling the size of the City district heating network
- Development of a local biomass processing and transfer site
- Significant capacity of new biomass CHP plant with associated district heating
- Consideration of a City anaerobic digester

Alongside energy generation, Nottingham will need to make a significant cut in energy demand to provide a 26% reduction in carbon emissions to 1,329k tonnes CO_2 per annum by 2020 as stated in the Sustainable Communities Strategy, but also to enable the achievement of target energy generation (reduction in demand eases proportional generation targets).

The City Council will lead by example by targeting a 45% reduction in emissions by 2020. The majority of emission cuts will however come from the domestic sector; reducing energy consumption and reducing the impact of fuel price increases. The City will be able to achieve a 37.6% reduction in CO_2 emissions from domestic energy efficiency by 2020. This will be achieved through the work of the City Council, Nottingham Energy Partnership and local housing associations working with householders and communities. A 23.4% reduction in CO_2 emissions is expected from industrial and commercial sector energy efficiency by 2020.

Significant savings of around 20% also need to be made in transport emissions. A further saving of around 5% will be met from installing all the low or zero energy generation systems detailed in the Strategy. Over all these saving should provide a total reduction of 28.3% by 2020.

The Challenge

Funding for the major energy generation, supply chain and energy efficiency programmes will be the greatest challenge. This Strategy has identified the key strategic objective and numerical targets, the Action Plan details priorities for investment. These priority actions provide the best carbon, energy and financial returns and will provide a focus for development over the next 10 years.

7.3 Peak Oil

Nottingham City Council was one of the first UK Local Authorities to recognise the challenge of Peak Oil.

Peak Oil is the time when maximum oil production point is reached globally. After this point the production rate will decline. After Peak Oil the production and availability of oil will decline, and oil prices will rise. The UK's oil peak was in 1999.

Oil and oil based products are widespread in modern living. Products such as crop fertilisers, detergents, solvents, adhesives and most plastics would become more expensive as these products would become scarce.

This Council acknowledges the forthcoming impact of Peak Oil. The Council therefore needs to respond, and help our citizens respond to the likelihood of the shrinking oil supply but in a way which will nevertheless maintain the City's prosperity. It acknowledges that actions taken to adapt to and mitigate against climate change also help us adapt issues around Peak Oil.

It will do this by:

- developing an understanding of the impact of Peak Oil on the local economy and the local community
- encouraging a move across the city towards sustainable transport, cycling and walking throughout the city
- pursuing a rigorous energy efficiency and conservation programme through its carbon management plan, the work towards EMAS accreditation and on leading on raising energy awareness across all sectors to reduce dependency on oil based energy in the city
- supporting research and production within the city which helps develop local effective alternative energy supplies and energy saving products in order to encourage a move away from oil based fuels and also in order to create local 'green collar jobs'
- co-ordinating policy and action on reducing our city's carbon dependency and in response to the need to mitigate and adapt to climate change and Peak Oil

In this way Nottingham City Council will not only be helping the city to rise to the challenge of Peak Oil but also encourage the city to grasp the opportunities which Peak Oil offers.

8 Implementation of Action Plans

Table 8.1a Action Plan Progress – City Centre Air Quality Management Area Action Plan Update June 2011

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1	**Turning Point Major Integrated Transport Scheme**	Redistribution of cross-city traffic movements with restricted access to Milton Street/Lower Parliament Street Area to achieve high level pedestrian and bus priority	City Council	2002-03	2004-06	Congestion Bus use Pedestrian footfall Area wide traffic mileage	< 1µg/m^3	New traffic scheme introduced for Northern quadrant of inner ring road. Pavement widening and enhanced bus waiting facilities Enforcement of restrictions have been strengthened through introduction of bus gates.	Scheme completed November 2006. 76% reduction in traffic volumes on restricted access streets. 6% increase in pedestrian footfall, 11% increase in cyclist movements with 700,000 additional bus passengers	2006	Traffic redistribution within AQMA area. Increased priority for buses without significant traffic displacement impacts.
2	**Parksmart**	Variable message signing and zonal car park direction signing system to direct traffic to available car park parking availability	City Council	2008	2009-10	Congestion	< 1µg/m^3	Business case prepared. Network of real time parking availability signs and VMS installed. Includes supporting marketing information.	System installed and operational.	2010	Lessening congestion by reducing circulating traffic speculatively searching for a car parking space

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
3	**Statutory Bus Quality Partnership Scheme**	UK's first City Centre wide statutory quality partnership scheme	City Centre	2009	2010	Bus use Bus reliability	< 1µg/m^3	Scheme implemented.	Monitoring performance.	2010	Management of all bus services operating in the City Centre including of minimum bus emission standards
4	**Connecting Eastside - Phase 1**	Huntingdon St/Lower Parliament St (between Mansfield Road and Southwell Road) to become strategic two-way traffic route with associated public realm improvement package	City Council	2006-08	2009-11	Traffic volume Pedestrian footfall Cycling trips	< 1µg/m^3	Funding package including EMDA and ERDF funding secured. Scheme under construction.	Highway works largely complete. Sneinton Square public realm works underway.	2011	Traffic redistribution within AQMA area. Will encourage more walking and cycling.
5	**Connecting Eastside - Phase 2**	Cranbrook St/Bellar Gate bus priority route and local access	City Council	2006-2010	2012-16	Bus use Public transport accessibility	< 1µg/m^3	Preliminary design complete. Funding opportunities being explored.	Scheme included in LTP3.	2016	Traffic redistribution within AQMA area. Will increase public transport accessibility to Eastside of the City and thus support sustainable regeneration.
6	**Primary Pedestrian Routes**	Increased priority for pedestrians across inner ring road	City Council	Annual programme	2011-14	Pedestrian footfall	< 1µg/m^3	Hockley scheme completed in October 2007. Shared surface treatment, public realm and pavement	Other routes in development including as part of Connecting	2014	Will encourage more walking and modal change from car.

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
		junctions and upgraded routes from City Centre through regeneration areas.						widening from Carlton Street to Cranbrook Street. Includes infilling of all pedestrian subways. Alfreton Road footway and crossing improvements linking residential areas to the city centre complete in September 2010. Routes implemented as part of Connecting Eastside Phase 1. Other routes in development including those part of latter phases of Connecting Eastside.	Eastside project.		
7	**Commuter cycle routes**	On road cycle route improvements includes road space reallocation, cycle lanes and advanced stop lines at junctions	City Council	Annual programme	2011-14	Cycling trips	< 1μg/m^3	£250k allocated per year in LTP. Hucknall Rd scheme completed in 2009 and Strelley Route in 2010. Clifton route completed. Outstanding elements of Strelley and Hucknall Road completed.	Other routes in development as part of LTP3 implementation plan.	2014	Will encourage more cycling and modal change from car.
8	**Big Track**	Off road circular cycle route via City Centre. Includes Embankment Link and upgrading of footbridge to accommodate cyclists.	British Water-ways	2006-08	2008-12	Cycling trips	< 1μg/m^3	Funding secured from GNTP/EMDA, Growth Point and LTP. Delivery managed by British Waterways. 10 mile off-road route complete.	Meadow Lane lock enhancements completed. Design proposed for remaining Clifton Bridge section.	2011	Will encourage more cycling and modal change from car.

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
9	**Travel Plans**	Travel plans and business support package for employers.	City Council	Annual programme	2011-14	Travel plans	1μg/m^3	Local Plan requires travel plan for all large-scale development schemes. Travel plan advice and business support package available to employers.	Travel plans in place for 50,000 employees (approximately 30% of the workforce) Business support launched linked to WPL implementation.	Ongoing	Discourages car use for commuting journeys. Will encourage modal change to more sustainable modes and car sharing.
10	**Smarter Choices**	Encouraging and supporting travel using sustainable modes	City Council	Annual programme	2011-2014	Congestion Public transport use Pedestrian footfall Cycling trips	1μg/m^3	Funding bid to the Local Sustainable Transport Fund submitted in April 2011 for key component bid and in June 2011 for Expression of Interest on large scale proposals.	Funding package established.	2014	Discourages car use for commuting journeys. Will encourage modal change to more sustainable modes and car sharing.
11	**Station Hub**	Rail capacity improvements and development of modern transport interchange	City Council/ Network Rail/ East Midlands Trains	2006-11	2010-14	Congestion Public transport use	1μg/m^3	Business Case approved. Planning application submitted.	Funding package finalised. Advanced highway and public realm improvements underway. Work on multi-storey car park underway.	2014	Will reduce congestion and encourage modal change.
12	**NET Phase Two**	Tram network extensions to Clifton and Chilwell via Beeston	City Council	2006-11	2011-14	Tram use Congestion	1-2 μg/m^3	Programme entry approval secured October 2006. Transport and Work Act Order submitted April 2007. Public Inquiry completed January 2008. Development of	Tramlink consortium selected to design, build, operate and maintain the expanded system. Planned	2014	Will encourage modal change from car and thus reduce congestion as well as supporting sustainable development.

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
								scheme design and future procurement arrangements ongoing.	construction to commence in 2011.		
13	**NET Future Phases**	Other tram network extensions linked to sustainable urban extensions	City Council	2011-16	Post 2019	Tram use Congestion	1-2 $\mu g/m^3$	Consideration of NET future phases included in LTP3. Subject to preliminary design and economic assessment.	NET future phases and infrastructure requirements being explored linked to the consideration of new developments through the development plan process.	Post 2019	Will encourage modal change from car and thus reduce congestion as well as supporting sustainable development
14	**Workplace Parking Levy**	Employers charged for commuter car parking provision (>10 spaces). Revenue generated to fund significant public transport improvements	City Council	2006-12	2012	Congestion Public transport use	1-2 $\mu g/m^3$	Business case agreed by DfT. Examination in public completed. Scheme order approved. Business support workshops being held over summer 2011.	Scheme commencement of licensing to commence October 2011. WPL charging to commence April 2012.	2012	Fiscal measure to discourage commuting by car coupled with significant improvements to public transport alternatives.
15	**Park and Ride**	Expansion of Park and Ride capacity	City and County Councils	2011-14	2008-14	Public transport use	< 1$\mu g/m^3$	Queens Drive park and ride facility expansion completed - 2009. New sites and expansion of other sites linked to sustainable urban extensions.	Two large scale sites planned linked to delivery of NET Phase Two.	2014	Reduces congestion through less vehicle movements to the City Centre.
16	**A52 Ring Road upgrading**	Upgrading of Ring Road Radcliffe to Clifton Bridge as recommende	Highways Agency	Post 2014	Post 2019	Congestion	< 1$\mu g/m^3$	Feasibility being considered as part of Growth Point programme. Requires prioritisation through Regional Funding	Sustainable urban extensions and infrastructure requirements identified	Post 2019	Reduced congestion by increasing capacity of ring road around the south of the

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
		d in the A52 MMS						Allocations process.	through Aligned Core Strategy process		conurbation.
17	**New River Crossing**	New Trent River crossing at Radcliffe. Development of alternative traffic routes to the east of the conurbation.	County Council	Post 2014	Post 2019	Congestion	4-5µg/m^3	Feasibility considered as part of A52 multi-modal study. Not currently programmed.	Sustainable urban extensions and infrastructure requirements being identified through Aligned Core Strategy process	Post 2019	Reduced congestion through provision of an alternative route for cross-city traffic movements to the east of the conurbation.
18	**'Centrelink' Linkbus development**	Purchase of electric vehicles to operate service	NCC	2010	2011	Public transport use	< 1µg/m^3	Green Bus Funding secured from DfT.	Buses ordered for service.	2011	Reduce carbon emissions from public transport vehicles. Encourage public transport use
19	**Electric vehicle charging infra-structure**	Charging point at employment and interchange sites	City Council	2009-10	2011-13	Availability of charging points	< 1µg/m^3	Plugged in Places funding secured for the installation of a number of electric vehicle charging points at key employment sites.	Installation sites agreed	2013	Will encourage modal change from car.

Table 8.1b: Action Plan Progress – Ring Road (Dunkirk) Air Quality Management Area Action Plan Update June 2011

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1	**A52 full signalisation of junction**	Derby Road/Ring Road junction	Highways Agency	2009-10	2011	Congestion Bus punctuality	< 1µg/m^3	Consultation on scheme proposals.	Linked to maintenance scheme.	2011	Will help to smooth traffic flow and ease congestion
2	**NET Phase Two**	Network extension to Chilwell via Beeston (including Park and Ride at Bardills) includes stop to serve QMC and interchange with local bus services	City Council	2006-11	2011-14	Tram use Congestion Reduction in monitored nitrogen dioxide levels on Beeston Road	1-2µg/m^3	Programme entry approval secured October 2006. Transport and Work Act Order submitted April 2007. Public Inquiry completed January 2008. Development of scheme design and future procurement arrangements ongoing.	Tramlink consortium selected to design, build, operate and maintain the expanded system. Planned construction to commence in 2011.	2014	Will encourage modal change from car and thus reduce congestion as well as supporting sustainable development.
3	**Ring Road major**	Integrated transport scheme to increase junction capacity, improve an orbital bus service, upgrade interchange facilities, improve cycle and footway facilities and provide better parking provision for residents	City Council	2006-11	2011-13	Congestion Public transport use Bus punctuality Monitored nitrogen dioxide levels	1µg/m^3	Following CSR, scheme placed into development pool for further consideration and assessment. Expression of interest submitted in January 2011. Best and final business case being worked up for submission to DfT in Autumn 2011. Decision expected in December 2011.	Nitrogen dioxide diffusion tube monitoring along ring road initiated January 2010	2014	Will smooth traffic flow and reduce congestion. Improved orbital bus will encourage modal change supported by better interchange facilities that will simplify transfer between radial and orbital bus services without the need to travel via the City centre.

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
4	**Ring Road bus service capacity upgrade**	New larger vehicles to operate 'Medi-link' Ring Road orbital bus service	City Council	2010-11	2012	Bus use	< 1µg/m^3	Upgraded to 10-minute frequency service from March 2007. Free link between two major hospital campuses, NET and Queens Drive Park and Ride facility. Provides interchange with radial public transport services.	Three double decker buses introduced. Usage up to 23,000 passengers per week	2012	Improves accessibility of two large hospital campuses and encourages modal change. Linked to hospital travel plans.
5	**'Medilink' Linkbus development**	Purchase of electric vehicles to operate service	City Council	2010-2011	2011-2014	Public transport use	< 1µg/m^3	Green Bus funding secured from DfT. Electrification of full fleet included as part of Sustainable Transport Fund bid submission.	Funding package established.	2013	Reduce carbon emissions from transport vehicles. Encourage public transport use.
6	**QMC Inter-change**	Development of bus interchange and in the future tram within the hospital site	City Council	2010-13	2013-14 (linked to delivery of NET Phase Two)	Public transport use	< 1µg/m^3	Being designed as part of NET Phase Two project.	As NET Phase Two.	2014	Supports public transport integration.
7	**Electric vehicle charging infra-structure**	Charging point at employment and interchange sites	City Council	2009-10	2011-13	Availability of charging points	< 1µg/m^3	Plugged in Places funding secured for the installation of a number of electric vehicle charging points at key employment sites.	Installation sites agreed	2013	Will encourage modal change from petrol/diesel cars.
8	**Cycle Links**	Cycle network development	City Council	Annual programme	2011-2014	Cycling trips	< 1µg/m^3	Upgrading of commuter cycle routes and ring road cycle facilities.	One commuter route per year to be implemented 2011 to 2014.	2014	Will encourage modal change from car onto sustainable modes.

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
9	**Bus/cycle integration project**	Carbon reduction demonstration project involving installation of cycle parking facilities at bus interchanges.	City Council	2009	2009-11	Cycling trips Bus trips Carbon reduction	< 1µg/m^3	EMDA funding secured. Interchange points agreed. Equipment installed. Marketing leaflets delivered to local residents and location of bus stops with cycle parking placed on NCT timetables and online journey planner.	Installation complete.	2011	Will encourage mode change from car through extending the catchment areas of high frequency bus services.
10	**UCycle project**	Cycling England national demonstration project to encourage more students and staff to cycle to Higher Education sites.	Sustrans	2008-09	2009-11	Cycling trips Proportion of people cycling to University institutions	< 1µg/m^3	Business case prepared leading to a successful bid to Cycling England. Funding for infrastructure also secured from EMDA. Planning for future phases/expansion being considered as part of Local Sustainable Transport Fund bid.	Staff appointed to work with University institutions incl. University Hospital. Bike hire commenced in September 2010 across all sites.	2011	Will encourage modal change from car.
11	**Travel Plans**	Including updating of hospital and University plans	City Council	2006	2006-11	Travel plans	1µg/m^3	Local Plan requires travel plan for all large-scale development schemes. Lenton Lane area travel plan developed as a Highways Agency pilot project involving 25 employers covering 7,000 employees in the vicinity of the Ring Road. Queens Medical Centre and Nottingham University staff travel surveys completed.	Lenton Lane area travel plan launched June 2008. Dedicated travel plan website for Lenton Lane area received 1,000 hits on its launch day. Staff car parking reduced at QMC site.	Ongoing	Will encourage modal change from car.

No	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target NO_2 annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
12	**Workplace Parking Levy**	Employers charged for commuter car parking provision (>10 spaces). Revenue generated to fund significant public transport improve-ments	City Council	2006-12	2012	Congestion Public transport use	1-2µg/m^3	Business case agreed by DfT. Examination in public completed. Scheme order approved. Business support workshops being held over summer 2011.	Scheme commence-ment of licensing to commence October 2011. WPL charging to commence April 2012.	2012	Fiscal measure to discourage commuting by car coupled with significant improvements to public transport alternatives.

For the above tables - under the heading '**Target NO_2 annual emission reduction in the AQMA**' a value of < 1µg/m^3 indicates that whilst the individual measure may have a negligible impact however it will contribute to overall emissions reduction.

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

The 2010 monitoring results show that there were no exceedences of the Air Quality Objectives for PM_{10}, sulphur dioxide and benzene. This is consistent with findings reported in previous Review & Assessment reports.

The trend information for sulphur dioxide and benzene show that although 2010 annual mean concentrations were higher than in previous years, generally concentrations have been reducing with a significant decrease in measured levels since 2006.

Exceedences of the nitrogen dioxide annual mean AQO were measured at three automatic sites and eleven diffusion tube sites. Whilst most of these sites are within AQMAs - two of the diffusion tube sites are not. These two tubes are on or adjacent to residential properties where there is relevant public exposure.

The trend information shows that, since start up in 2005, the nitrogen dioxide annual mean AQO has been exceeded at the CG NOx within No.2 AQMA in most years and that there was a gradual increase in levels for the first 4 years.

In contrast the trend at the AURN urban background site has been decreasing concentrations that have levelled out for the last few years with no exceedences of the nitrogen dioxide annual mean AQO measured since 2004. The AURN 2010 nitrogen dioxide annual mean was on the borderline for exceedence and represents a significant increase compared with the last nine years' data. This may be due to the extreme weather experienced in the last few months of 2010.

The results show that exceedences of the annual mean nitrogen AQO continue to be measured at sites within the existing AQMAs consequently they should not be revoked.

It is apparent from the 2010 monitoring data that there were two sites outside of the AQMAs where exceedence of the annual mean nitrogen AQO occurred. There is relevant public exposure at these sites.

Therefore it is necessary to proceed to a Detailed Assessment for annual mean nitrogen dioxide.

9.2 Conclusions relating to New Local Developments

Of the new local developments outlined in Section 3 the Station Hub redevelopment, Nottingham Express Transit (NET) Phase Two, the Ring Road Major Scheme, the Broad Marsh/Turning Point South and Turning Point East schemes may require more detailed consideration in the next Updating and Screening Assessment.

As noted in the PR 2010 the use of biomass to meet the renewable energy requirements in planning applications and its increasing use in the industrial and domestic sector may have an impact on local air quality in the future. A more detailed consideration of this aspect may be needed in the next Updating and Screening Assessment.

9.3 Other Conclusions

With regard to the LTP2 Air Quality Action Plan a number of schemes such as Turning Point Major, Parksmart, Statutory Bus Quality Partnership Scheme have been fully implemented. Other measures with an estimated completion date of 2011 include:

- Connecting Eastside Phase 1 – a funding package including East Midlands Development Agency (EMDA) and European Regional Development Fund (ERDF) funding has been secured and the shame is under construction. The highway works are largely complete.

- the Station Hub – the funding package has been finalised. Advanced highway and public realm improvements are underway and work on the multi-storey car park has commenced.

- 'Centrelink' Link Bus development – Green bus funding for electric vehicles to operate the service has been secured from the Department for Transport and the buses have been ordered.

A number of measures in the LTP2 Air Quality Action Plan have been carried through into the LTP 3 AQAP and progress with these will continue to be reported in future LAQM reports.

The NET (Nottingham Express Transit) Phase 2 – the tram network extensions have the potential to impact positively on air quality by encouraging modal change from cars and reduce congestion.

Subject to final negotiations and the contract being awarded in late summer 2011, construction work on the new lines could start by the end of the year. Passenger services across the extended tram network could be fully operational by the end of 2014.

Together with Line One, NET will provide tram based Park & Ride sites near all three M1 junctions into Nottingham.

Twenty of the 30 largest employers in Greater Nottingham will be within 800m of a tram stop once the network is complete - with around 55,000 commuters within reach of the system. NET Phase Two will increase the number of passenger journeys across the extended tram system to an estimated 20 million a year and will take approximately three million car journeys off Nottingham's roads.

Air quality issues will be an integral part of the ongoing work being undertaken by Nottingham City Council to develop and implement the Local Development Framework for land use planning.

For the LAQM process currently there are no AQOs for ozone but it is a pollutant of concern because of its potential to affect human health and ecosystems. It has been measured at the Nottingham Centre national network monitoring station since 1996. The AURN 1996 -2010 data trend in ozone concentrations i.e. generally increasing between 1997 and 2008 with decreasing ozone concentrations in 2009 and 2010 is similar to the national trend at urban background sites.

9.4 Proposed Actions

The 2010 monitoring data has identified the need to proceed to a Detailed Assessment for the annual mean nitrogen dioxide Air Quality Objective in 2 areas:

- around the junction of the Outer Ring Road (A6514) with Nottingham Road (B682) which is in a residential/commercial area approximately 3.5km to the north west of the City centre

  and

- in the vicinity of the roundabout where Castle Boulevard (A6005) meets Abbey Bridge (A6005) - a mainly residential area approximately 1.7km west of the City centre.

Additional diffusion tubes have been located around these junctions since January 2011. The results will assist in evaluation for the Detailed Assessment.

Exceedences of the annual mean nitrogen AQO were measured at sites within the existing AQMAs consequently the AQMAs should not be revoked and it is appropriate to maintain their current boundaries.

For PM_{10}, sulphur dioxide and benzene none of the AQOs were exceeded.

Conclusion from the work undertaken for this report:

- **it is necessary to proceed to a Detailed Assessment for annual mean nitrogen dioxide in 2 areas of the City.**

What Happens Next?

The next steps that Nottingham City Council will take to fulfill its LAQM duties are:

- to submit this 2011 Progress Report to Defra

- to complete the Further Assessment, which is a statutory requirement as a consequence of the amended Air Quality Management Areas (varied by Order dated 22 June 2010) and; undertake the necessary consultation with statutory consultees, businesses and the general public.

- to progress to a Detailed Assessment in respect of the annual mean nitrogen dioxide Air Quality Objective - i) around the junction of the Outer Ring Road (A6514) with Nottingham Road (B682) and ii) in the vicinity of the roundabout where Castle Boulevard (A6005) meets Abbey Bridge (A6005). This also requires consultation with statutory consultees, businesses and the general public.

  The Detailed Assessment, which is a statutory requirement following likely exceedence of an AQO, will be initiated following Defra's acceptance of the conclusions of this Progress Report.

- to undertake an Updating and Screening Assessment by 30 April 2012 in accordance with the Review and Assessment timescales outlined in the LAQM Policy Guidance (PG09).

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Appendices

Appendix A: Estimation of Annual Mean NO_2 Concentration from Short-term Monitoring Data

Appendix B: Diffusion Tube Data Adjustment

Appendix C: QA/QC Information for Automatic and Diffusion Tube Monitoring

Appendix D: Unadjusted Monthly Diffusion Tube Data

Appendix A: Estimation of Annual Mean Concentration from Short-term Monitoring Data

The short term to long term data adjustment for the SA NOx St Andrew's Road nitrogen dioxide data was undertaken following the guidance in TG(09) using the calculation method given in Box 3.2.

The 3 comparison sites were chosen because they are urban background sites in reasonable proximity to the north, south-west and south of Nottingham City.

The dates used for the period mean at each site were 1 to 31 July 2010 and 1 September to 31 December 2010 - a total of five months. This covered the period that data was available for the SA NOx site following its set up in June 2010. There was a problem with the analyser during most of August.

The calculated average ratio is 1 which means that the estimated annual mean value is the same as the measured NO_2 mean for the 5 months of monitoring.

Table A-1 Estimated Annual Mean NO_2 at SA NOx, St Andrews Road Site

Site	**Site Type**	**Period Mean** µg/m^3	**Annual Mean** µg/m^3	**Ratio** (Am/Pm)
Chesterfield -CHS6	Urban Background	17.4	19.5	1.118
Coventry Memorial Park - COV3	Urban Background	22.7	21.2	0.935
Leicester Centre	Urban Background	42.7	41.5	0.971
			Average ratio Ra	**1.01**
		Period Mean µg/m^3	**Annualised Mean (Pm x Ra)** µg/m^3	
SA NOx St Andrews Road	Roadside	46.3	46.8	

Appendix B: Diffusion Tube Data Adjustment and QA/QC Information

Diffusion Tube Bias Adjustment Factors

B-1 NO_2 Diffusion Tube Bias Adjustment

Nottingham City Council's diffusion tubes are supplied and analysed by Gradko International, Hampshire. The tubes are prepared using a 20% solution of triethanolamine (TEA) in de-ionised water and are exposed on site for one month before being returned for laboratory analysis.

The R&A Helpdesk Database 2010 bias adjustment factor for Gradko 20% TEA in water tubes = 0.92. This figure is the average of 39 studies using kerbside, roadside, urban centre, urban background and other sites and was taken from Spreadsheet Version Number: 04/11.

Diffusion tube precision was good for 31 of the 39 studies used to derive the national bias adjustment factor. Tube precision is categorised as 'good' "where the coefficient of variation (CV) of triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than10%". (LAQM.TG(09))

Factor from Local Co-location Studies

Throughout 2010 triplicate diffusion tubes were co-located at 3 continuous analyser sites, 1 urban centre and 2 roadside.

Table B-1 gives the bias adjustment factors for our co-location study for the 2 road sites; the figures in the table have been calculated from 12 months' ratified data (January to December 2010). The averaged bias adjustment factor = 0.95.

Table B -1 Nottingham City Council's Bias Adjustment Factor

Site	Site Type	Cm NO_2 $\mu g/m^3$	Dm NO_2 $\mu g/m^3$	Bias Adjustment Factor, A (Cm/Dm)	Data Capture % Cm	Data Capture % Dm	Precision (CoV) %
AURN Clinton St E	Urban Centre	40	40	1.01	98.6	100	8
CG NOx, Carter Gate	Roadside	43	45	0.95	99.6	100	6
LS NOx, Lace Street	Roadside	41	44	0.94	99.7	100	5
Averaged bias adjustment factor				0.97 - all 3 sites **0.95** - 2 roadside sites			

12 months data January to December 2010

Cm = chemiluminescence (continuous) analyser measurement
Dm = diffusion tube measurement (average of 3 tubes)
CoV = Coefficient of variation

Nottingham City Council's co-location data has been entered in the R & A Database site.

Discussion of Choice of Factor to Use

The 2010 national bias adjustment factor is 0.92 however there are a number of aspects that militate against using the factor for the Nottingham City Council data:

- for the 23 of 39 national sites that are roadside the average adjustment factor = 0.91

- for the 10 of 39 sites that are Urban Centre, Urban Background or Background the average adjustment factor = 0.96.

- all but the three background tubes are at roadside locations, the average factor for Council's 2 roadside sites = 0.95 and for the AURN Urban Background the factor = 1. The 0.5 difference between roadside and other sites factors is same as the distinction with national factors.

Use of national factor for all sites 0.92 or just roadside sites i.e.0.91 to adjust values would lead to lower nitrogen dioxide concentrations values but may lead to underestimation.

In contrast, to use all the local site data the adjustment factor would be 0.97 which would lead to higher adjusted NO_2 concentrations (compared with using the national adjustment factor) and may lead to overestimation. Therefore the decision was taken to use the averaged local adjustment factor for the 2 roadside sites as being the most representative and a compromise between the various factors that could have been used.

The local factor was used to adjust the diffusion tube values because Nottingham City Council's co-located tubes were exposed at sites that are representative of the majority of the single tube locations and; the local data had good 'precision', good overall data capture and the co-efficient of variation was low at each of the sites. This choice is consistent with advice given in LAQM.TG(09).

The 2010 diffusion tube unbiased monthly nitrogen dioxide concentrations are given in Appendix D Table D-1.

Appendix C: QA/QC Information for Automatic and Diffusion Tube Monitoring

C-1 QA/QC for Automatic Monitoring

Quality Control, Maintenance, Calibration

AURN Site

The analysers at the AURN site are subject to a four weekly calibration regime. The calibrations are undertaken by a trained local site operator (LSO) and conducted in accordance with the Local Site Operators' Manual. Nottingham City has 3 trained LSOs who are audited as to their performance on an on-going basis.

The LSO changes the filters for the TEOMs and FDMS and cleans the TEOM heads approximately every 12 weeks, in accordance with the Local Site Operators Manual, when requested by the Central Management and Co-ordination Unit (CMCU).

The equipment is fully serviced every six months. In 2010 this was undertaken by Casella Measurement, Bedford.

The site is audited by AEA Energy & Environment on a six monthly basis.

CG NOx, LS NOx and SA NOx Sites

At Nottingham City Council's CG NOx, LS NOx and SA NOx sites calibrations are carried out fortnightly. The calibrations, using zero air and span gases, are undertaken by the same LSOs as those for the AURN site and are conducted using the same principles and procedures as given in the AURN LSO Manual.
The equipment is fully serviced every six months by Casella Measurement, Bedford.

Calibration Gas Traceability

AURN Site

Calibration gases used in the AURN are supplied by AIR Liquide who have demonstrated compliance with relevant quality control procedures in the preparation of gas mixtures. The gas mixtures are certified by AEA Energy & Environment.

CG NOx, LS NOx and SA NOx Sites

Calibration gases used in the CG NOx, LS NOx and SA NOx monitoring sites are supplied by AIR Liquide who have demonstrated compliance with relevant quality control procedures in the preparation of gas mixtures. The gases are supplied with a certificate of analysis.

Data Collection and Processing

AURN Site

The AURN station's data logger is continuously interrogated by Bureau Veritas the Central Management and Co-ordination Unit (CMCU). The data obtained is validated by CMCU and passed to the Data Dissemination Unit (DDU).
Information about the AURN station and available data can be found on the internet at http://uk-air.defra.gov.uk.

CG NOx, LS NOx and SA NOx Sites

For Nottingham City Council's sites all data collection, validation and ratification is carried out by the Council's Noise & Pollution Control team.

Throughout 2010, data from the CG NOx, LS NOx and SA NOx sites was polled remotely directly from the analysers and collected as 15 minute averages using Envista ARM data collection software. The data have been scaled and converted into hourly or other values using the Envista ARM data management system

The software allows users to remotely view, analyse, report and distribute environmental quality data. Manipulation of raw data to verified data can be conducted in a structured approach.

Data validation is carried out and involves screening the scaled values to identify unusual measurements, errors due to equipment failure etc. and flagging them for further investigation.

Data ratification is carried at approximately 2 monthly intervals. This involves looking at the data more closely and includes:

- examination of calibration records to ensure correct application of calibration factors;
- examination of data for other pollutants and monitoring sites to highlight any anomalies;
- deletion of data shown from chart or other records to be spurious, for example, spikes generated by the analyser;
- correction of any baseline drift as indicated by examination of daily automatic calibration records.

Once this process has been carried out and data has been verified, amended or rejected as appropriate the data is ratified. This final data set is used for the R & A process.

C- 2 QA/QC for NO_2 Diffusion Tube Monitoring

Gradko International supply and analyse Nottingham City Council's diffusion tubes. The organisation is UKAS accredited and is assessed annually for compliance to ISO 17025 and participates in other proficiency schemes.

Gradko confirmed that:

- their procedures follow the guidance issued on behalf of Defra (AEA Energy & Environment, Feb 2008) relating to the preparation, extraction, analysis and calculation procedures for passive NO_2 diffusion tubes

Gradko participate in a number of QA/QC monitoring systems to demonstrate satisfactory performance i.e.:

- The Workplace Analysis Scheme for Proficiency (WASP) programme to ensure uniformity in data throughout the year.
- The monthly field inter-comparison exercise with other laboratories to enable assessment of bias and precision undertaken by AEA Energy & Environment.
- An external QC scheme to check solutions run by AEA Energy & Environment.

WASP

This involves monthly analysis of doped tubes, allowing assessment of overall uniformity of data throughout the year. Each participating laboratory's results are analysed by AEA Energy & Environment and combined to give an annual relative standard deviation. If this value is greater than + 15% of the Performance Target then the laboratory's performance for the year in the WASP scheme will be deemed unsatisfactory. Only laboratories that remain in the WASP scheme are used for analysing tubes from the National NO_2 diffusion tube non-automatic network.

Gradko International's performance for the last most recent five rounds (rounds 105 – 109) was rated as good.

Appendix D

Table D-1 2010 Diffusion Tube Monthly Unadjusted Nitrogen Dioxide Concentrations (µg/m^3)

Site Id	Location	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Raw Mean µg/m^3
C	Clifton Boulevard	49	m	m	33	33	29	25	29	37	45	53	44	37.6
G	Beeston Road	53	56	48	43	39	35	36	33	39	45	49	49	43.7
I	Derby Road	48	48	42	31	32	30	29	28	26	28	46	43	35.8
X	Western Blvd	45	42	41	36	30	28	30	26	37	28	46	44	36.1
X2	Wilkinson Street	45	47	40	38	30	28	33	28	36	29	43	45	36.8
X3	Nottingham Road	53	49	52	46	39	40	36	37	41	31	55	49	43.9
X4	Danethorpe Vale	39	38	38	35	29	m	m	27	32	29	38	42	34.7
V2	Gregory Blvd	44	42	42	37	32	28	26	28	35	28	41	38	35.0
K	Castle Blvd	53	56	57	45	43	41	32	42	39	38	48	50	45.4
K3	Castle Blvd.(3)	58	59	57	50	m	m	34	34	47	48	63	53	50.4
V	Bentinck Road	46	46	43	44	36	33	30	31	40	27	49	48	39.4
M	Canning Terrace	59	67	63	56	56	46	43	42	61	58	82	56	57.4
N	Upper Parliam't St.	57	74	68	58	52	46	48	42	53	43	69	50	54.9
O	Shakespeare St.	64	62	59	58	47	47	42	41	49	45	57	56	52.3
P	Mansfield Road	58	65	61	59	56	44	36	40	54	42	74	57	53.7
P2	Mansfield Road (2)	44	42	53	44	34	35	36	38	39	33	49	49	41.4
Q	Woodborough Rd	60	62	61	59	48	45	40	36	52	45	57	51	51.4
Y	Beck Street	63	75	43	55	45	43	43	42	54	17	63	58	50.0
T	Queen's Road	70	60	66	50	51	46	43	46	57	56	67	56	55.6
Z	Kinglake Place	46	48	42	36	29	23	26	27	31	32	44	45	35.6
U	Trent Bridge	46	41	35	35	26	24	27	29	30	30	48	42	34.4
B1	Elson St.	38	28	m	51	21	17	15	19	27	26	38	38	29.0
B2	Hungerhill Rd.	39	27	25	22	17	13	18	18	m	6	35	40	23.6
B3	River View	43	38	30	29	21	m	m	23	m	17	35	38	30.4

m = missing