

Eastern Group Air Quality Progress Report

On Behalf Of:-

Ards Borough Council

Castlereagh Borough Council

Down District Council

Lisburn City Council

North Down Borough Council

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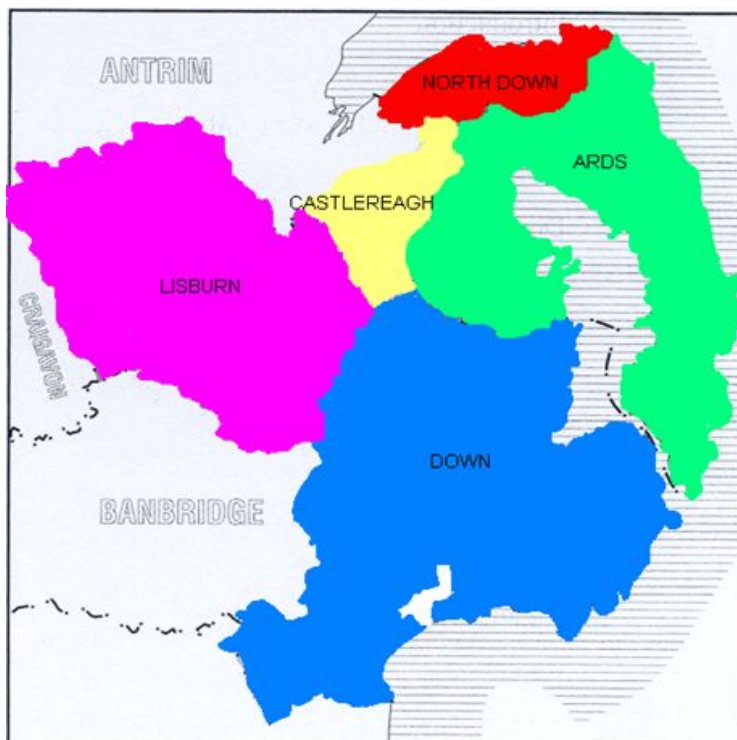
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1. Introduction

The Environment (Northern Ireland) Order 2002, requires local authorities to undertake an Air Quality Review and Assessment in their local areas and to meet the local air quality targets and objectives set out in the UK National Air Quality Strategy (2000). The production of an annual air quality report is now a statutory duty for all local authorities. The process is set out in the Department of Environment's Local Air Quality Management Policy Guidance LAQM PGNI (03). This year, as last, the Eastern Group of Councils decided to produce the progress report on a group basis to facilitate comparison and to give an overall view of the state of air quality in the area. This report, therefore, relates to the Ards Borough Council, Castlereagh Borough Council, Down District Council, Lisburn City Council and North Down Borough Council areas.

The Councils published detailed updating and screening assessments in May 2006. These reports were concluded on the basis of results from automatic and passive monitoring equipment. As a result of the Updating and Screening Assessment, Castlereagh had decided to move its PM10 monitoring station from Espie Way to Upper Newtownards Road Dundonald and combine this with NO₂ measurement (and remove SO₂ measurement). This site became operational in February 2007. In 2006 Lisburn moved its SO₂ monitoring equipment to Dunmurry to facilitate comparison with PAH monitoring and has now also sited a PM^{2.5} monitor along side its PM¹⁰ monitor at this site. Ards moved its SO₂ and PM10 monitor to a more appropriate location, in relation to the area that was indicated by modelling as likely to give rise to exceedences. As a result of this monitoring Ards have now revoked their Air Quality Management Area.

Figure 1 Map of Eastern Group



1.1 Purpose of the Progress Report:

Progress reports are required to be undertaken in the years when the authority is not carrying out updating and screening assessment or a detailed assessment of air quality.

This report outlines the Eastern Group of Councils progress on implementing local air quality management, and aims to:

- Report progress in achieving or maintaining concentrations below the air quality objectives outlined in the table below.
- Provide information on recent air quality monitoring.
- Identify trends within monitoring results.

It is normal practice only to consider a trend as being significant when five years worth of data is presented. This is the first reporting year in which all Councils have, five years ratified data for the automatic stations and this has been presented to give an idea of what type of trend may be developing. Five years data in relation to passive NO₂ tubes is available.

- Bring greater awareness within the local community of the importance of air quality issues.
- Identify planning applications that are likely to have a significant effect on the emissions of pollutants.
- Identify new IPC processes that might have an impact on the Air Quality objectives.

This report has been prepared in accordance with Progress Report Guidance LAQM. PRGNI (04).

Figure 2 Air Quality Objectives

Summary of objectives of the National Air Quality Strategy			
Pollutant	Objective	Measured as	To be achieved by
Benzene All Authorities	16.25 µg/m ³	Running Annual Mean	31 December 2003
Benzene Authorities in England and Wales only	5 µg/m ³	Annual Mean	31 December 2010
Benzene	3.25 µg/m ³	Running Annual Mean	31 December

Authorities in Scotland and Northern Ireland only			2010
1,3-Butadiene	2.25 µg/m ³	Running Annual Mean	31 December 2003
Carbon monoxide Authorities in England, Wales and Northern Ireland only	10.0 mg/m ³	Maximum daily running 8 Hour Mean	31 December 2003
Carbon monoxide Authorities in Scotland only	10.0 mg/m ³	Running 8 Hour Mean ^a	31 December 2003
Lead	0.5 µg/m ³	Annual Mean	31 December 2004
	0.25 µg/m ³	Annual Mean	31 December 2008
Nitrogen dioxide^b	200 µg/m ³ Not to be exceeded more than 18 times per year	1 Hour Mean	31 December 2005
	40 µg/m ³	Annual Mean	31 December 2005
Nitrogen Oxides**	(V) 30 µg/m ³	Annual Mean	31 December 2000
Ozone[*]	100 µg/m ³	Running 8 hour Mean Daily maximum of running 8 hr mean not to be exceeded more than 10 times per year	31 December 2005
Particles (PM10) (gravimetric)^c All authorities	50 µg/m ³ Not to be exceeded more than 35 times per year	24 Hour Mean	31 December 2004
	40 µg/m ³	Annual Mean	31 December 2004

Particles (PM10) Authorities in Scotland only ^d	50 µg/m ³ Not to be exceeded more than 7 times per year	24 Hour Mean	31 December 2010
	18 µg/m ³	Annual Mean	31 December 2010
Poly aromatic hydrocarbons^e	0.25 ng/m ³ B(a)P	Annual Mean	31 December 2010
Sulphur dioxide	266 µg/m ³ Not to be exceeded more than 35 times per year	15 Minute Mean	31 December 2005
	350 µg/m ³ Not to be exceeded more than 24 times per year	1 Hour Mean	31 December 2004
	125 µg/m ³ Not to be exceeded more than 3 times per year	24 Hour Mean	31 December 2004
	(V) 20 µg/m ³	Annual Mean	31 December 2000
	(V) 20 µg/m ³	Winter Mean (01 October - 31 March)	31 December 2000

Notes:

a. The Quality Objective in Scotland has been defined in Regulations as the running 8-hour mean, in practice this is equivalent to the maximum daily running 8-hour mean.

b. The objectives for nitrogen dioxide are provisional.

c. Measured using the European gravimetric transfer sampler or equivalent.

d. These 2010 Air Quality Objectives for PM 10 apply in Scotland only, as

set out in the Air Quality (Scotland) Amendment Regulations 2002.

e. Not included in regulations

$\mu\text{g}/\text{m}^3$ - micrograms per cubic metre

mg/m^3 - milligrams per cubic metre

*Ozone is not included in the Regulations

** Assuming NO_x is taken as NO₂

(V) These standards are adopted for the protection of vegetation and ecosystems. All of the remainder are for the protection of human health.

1.2 Structure of the report

The report is divided into a detailed section for each Council according to the parameters listed in 1.1.

The NO₂ Diffusion tubes for the trend reports were supplied and analysed by Ruddock and Sheratt up to November 2004. The Correction factor applied to these results is 1.374 as calculated using a co location study at the North Down Borough Council automatic site in 2003/4 in the absence of any other appropriate figure. Since November 2004 Cassella has supplied the tubes. The relevant correction factor for the years 2004 (0.83 for two months only), 2005 (0.80), 2006 (0.87) and 2007(0.92) have been applied. The tubes were prepared using 10% TEA in water.

The tube locations for each area are listed. However, some tubes have been recently installed and very little historical data exists. Therefore, these have been omitted from the trend graphs.

The Co-location studies from Castlereagh Lisburn and North Down have been submitted to netcen and have been included in the spreadsheet from which the correction factors have been derived at

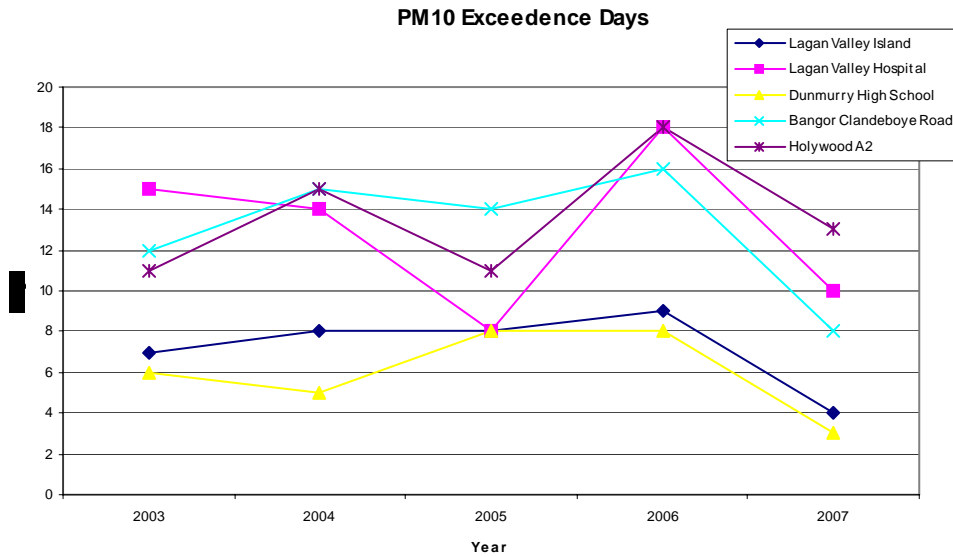
<http://www.uwe.ac.uk/aqm/review/diffusiantube290208.xls>

1.3 2007 Weather.

The weather in 2007 was characterised by higher winds than 2007 on average wind speeds for the year at the Holywood A2 monitoring site were up 0.5ms at 2.6 from 2.1 in the previous year. In addition, the number of calm days was much reduced. This is reflected in the number of days were the average PM¹⁰ levels exceeded 50 $\mu\text{g}/\text{m}^3$ in that the number of exceedance

days was reduced from the previous year at all of the automatic sites. Overall precipitation for both years was roughly similar in amount. However, in 2007 a very dry warm spring was followed by a particularly wet and windy summer!

Figure 3 PM10 50ugm3 Exceedance Days



2 Ards Borough Council

Ards Borough Council is situated east of Belfast on the shores of Strangford Lough, which is designated as an area of outstanding natural beauty and special scientific interest. The Borough comprises of 140 square miles, bounded by 90 miles of coastline. Ards remains one of fastest growing boroughs with the Northern Ireland Statistics and Research Agency Mid 2006 population estimates standing at 76,179 representing 4.4% of the total population of Northern Ireland.

The Borough is of mixed and urban rural character. The main town of Newtownards is located at the northern end of Strangford Lough and is a natural basin surrounded by hills. The prevailing wind direction is southwesterly. Air pollution problems are associated with the high dependency on coal fired domestic heating combined with the geographical features of the area that may result in temperature inversions. The other main centres of population include Comber, Donaghadee and Portaferry. Neighbouring Councils include North Down Borough Council, Castlereagh Borough Council and Down District Council.

Ards Borough Council's air quality monitoring site is located at the rear of the Ards Borough Council Leisure Centre on West Street, Newtownards. This is within the area the previously declared AQMA in relation to PM₁₀. The location of the monitoring equipment at this site and the data collected has enabled the AQMA to be revoked.

The Newtownards site is in an area of high density housing with a significant proportion of solid fuel burning.

Six NO₂ diffusion tubes are mounted at the following locations to monitor roadside emissions.

Figure 4 Ards Passive NO₂ Sites

Site Location	Easting (Irish Grid)	Northing (Irish Grid)
7 Ash Grove N'Ards	162300	530500
19 Islandmore Avenue N'Ards	163300	530900
Roundabout D'Dee Bangor Rd N'Ards	349607	374267
8 Court St N'Ards		
Town Hall 18 Frances St. N'Ards		
Traffic Lights Talbot St. N'Ards		

The exact locations of the monitoring sites are available at.

2.1 Progress in the past year.

From mid-2002 until April 2006, an automatic monitoring station was located at an urban background site in the Glen Estate, Newtownards, to monitor pollutants from the high density of domestic coal-burning properties in the area. PM₁₀ is monitored using an automatic TEOM sampler and sulphur dioxide is monitored using a UV fluorescence analyser. Modelling carried out for the combined 2nd/3rd review indicated the possibility of exceedence of the PM₁₀ objective. As a result an AQMA was Declared in 2005. The automatic monitoring station was moved to a location within the area of predicted exceedence and became operational in April 2006. The station is now located at the rear of Ards Leisure Centre, William Street, Newtownards. The monitoring results from this location indicated that it was unlikely that the objective for PM₁₀ would be exceeded. As a result Ards BC sought to have the AQMA for the area revoked which happened on 1 December 2007. Despite this the Council has been active in discussing a fuel conversion programme in the area with the NIHE, to reduce domestic emissions further.

2.2 Recent Air Quality Monitoring

The automatic station has been in operation for over a year at the Ards Leisure Centre, William Street site. During the 2007 period there have been Four exceedences of 50 µg m⁻³. The results are well within the current objective for PM₁₀.

**Produced by AEA Energy & Environment on behalf of
Ards Borough Council**

Produced by AEA Energy & Environment on behalf of Ards BC

ARDS LEISURE CENTRE 01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	SO₂	PM₁₀*+
Number Very High	0	0
Number High	0	0
Number Moderate	0	20
Number Low	15826	8550
Maximum 15-minute mean	74 µg m ⁻³	352 µg m ⁻³
Maximum hourly mean	37 µg m ⁻³	127 µg m ⁻³
Maximum running 8-hour mean	18 µg m ⁻³	78 µg m ⁻³
Maximum running 24-hour mean	10 µg m ⁻³	72 µg m ⁻³
Maximum daily mean	8 µg m ⁻³	67 µg m ⁻³
Average	2 µg m ⁻³	19 µg m ⁻³
Data capture	46.1 %	97.5 %

* PM₁₀ Indicative Gravimetric Equivalent µg m⁻³
+ PM₁₀ as measured by a TEOM using a gravimetric factor of 1.3 for Indicative Gravimetric Equivalent

All mass units are at 20°C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 $\mu\text{g m}^{-3}$	0	0
Sulphur Dioxide	Hourly mean > 350 $\mu\text{g m}^{-3}$	0	0
Sulphur Dioxide	Daily mean > 125 $\mu\text{g m}^{-3}$	0	0
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 $\mu\text{g m}^{-3}$	4	4
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 $\mu\text{g m}^{-3}$	0	-

2.3 Trends in results

Ards Borough Council has maintained a number of NO₂ diffusion tubes at roadside sites for a number of years. The diffusion tube studies for Ards for the past five years do not show any particular trends. Annual variation is more likely to be as a result of climatic conditions, rather than changes in emissions.

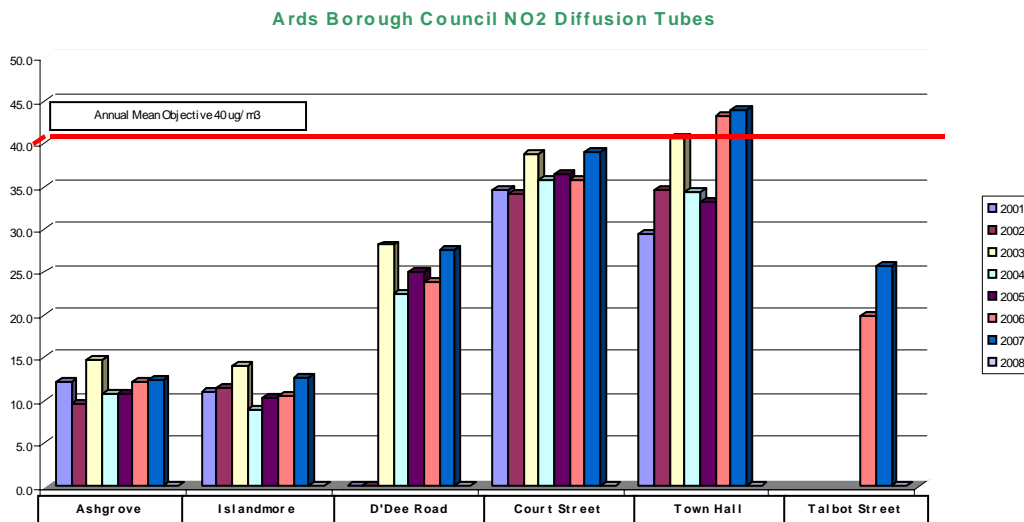


Figure 5 Ards Diffusion Tube Results

The Town Hall site although above the objective does not have relevant exposure. This tube was at this location as part of the old National Network survey. The tube at this location has therefore been moved to East Street N'Ards which is the nearest residential location to the Town Hall.

2.4 Significant New Development

The following roads have been proposed since before the last updating and screening assessment but have not yet commenced. The net effect of these proposals is likely to be a reduction in the NO₂ measurements at the Town Hall and Court Street passive monitoring sites shown above.

1. A20 Newtownards Southern Relief Road

This involves the construction of a new link road connecting the main A20 via Blaire Main Road South to the A21 Comber. Construction was expected in 2007 but appears now to be delayed.

An Environmental Impact Assessment was carried out at the planning stage, which adequately considered the impact on local air quality.

2. A20 Frederick Street Link, Newtownards

This involves creating a direct link from Nursery Road, Newtownards to the Frederick Street roundabout.

This road is now due for construction.

2.5 Significant New PPC Processes

None.

2.6 Summary in relation to Air quality Objectives.

Consultation is already in place with the NIHE, with regard to the fuel conversion programme for Newtownards. It appears that none of the current air quality objectives are being exceeded in the area. Further monitoring is taking place at the Ards Leisure Centre, William Street site with a view to revocation of the AQMA in relation to PM₁₀.

3 Castlereagh Borough Council

Castlereagh Borough Council covers an administrative area of 84Km² to the southeast of Belfast with the Northern Ireland Statistics and Research Agency Mid 2006 population estimates standing at 65,633. The Borough is of mixed and urban rural character and the predominant wind direction is from the southwest.

Castlereagh Borough Council's air quality monitoring sites are located at Upper Newtownards Road Dundonald and at the side of the A55 in the vicinity of Lough View Drive.

The AADT for the site at the A55 is 40,000 vehicles on a four-lane dual carriageway. The second automatic site in Castlereagh is located at the Upper Newtownards Road Dundonald. The Traffic Flow in this location is 24,220.

Castlereagh has 6 NO₂ diffusion tube sites at the following locations.

Figure 6 Castlereagh Passive NO₂ Sites

Site Location	Easting (Irish Grid)	Northing (Irish Grid)
Cregagh Road		
Everton Drive		
Downshire Park East		
Upper Newtownards Road		
Newtownbreda Road		
Saintfield Road		

In addition three diffusion tubes are co-located with the Lough View Drive automatic site.

3.1 Progress in the past year.

The Updating and Screening Assessment completed in 2006 indicated that current objectives in relation to SO₂ NO₂ and PM₁₀ would be achieved at the location of the automatic monitoring stations. However, a diffusion tube survey at the A20 in Dundonald indicated the possibility of exceedences in relation to NO₂. Therefore, the automatic station at Espie Way was decommissioned and the PM10 monitor together with a new NO₂ monitor has been installed in a roadside cabinet at the A20 in Dundonald. While the traffic flow in this area is 24,220 AADT, buildings in this area produce a significant canyon effect and there is relevant exposure at this location.

3.2 Recent Air Quality Monitoring

Produced by AEA Energy & Environment on behalf of Castlereagh BC

CASTLEREAGH LOUGH VIEW DRIVE 01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	NO _x	NO	NO ₂	PM ₁₀ *+
Number Very High	-	-	0	0
Number High	-	-	0	0
Number Moderate	-	-	0	30
Number Low	-	-	8435	8574
Maximum 15-minute mean	991 µg m ⁻³	551 µg m ⁻³	149 µg m ⁻³	267 µg m ⁻³
Maximum hourly mean	793 µg m ⁻³	446 µg m ⁻³	120 µg m ⁻³	172 µg m ⁻³
Maximum running 8-hour mean	457 µg m ⁻³	249 µg m ⁻³	78 µg m ⁻³	94 µg m ⁻³
Maximum running 24-hour mean	242 µg m ⁻³	116 µg m ⁻³	67 µg m ⁻³	85 µg m ⁻³
Maximum daily mean	190 µg m ⁻³	94 µg m ⁻³	57 µg m ⁻³	80 µg m ⁻³
Average	42 µg m ⁻³	13 µg m ⁻³	23 µg m ⁻³	22 µg m ⁻³
Data capture	96.3 %	96.3 %	96.3 %	97.9 %

* PM₁₀ Indicative Gravimetric Equivalent µg m⁻³

+ PM₁₀ as measured by a TEOM using a gravimetric factor of 1.3 for Indicative Gravimetric Equivalent

All mass units are at 20°C and 1013mb

NO_x mass units are NO_x as NO₂ µg m⁻³

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m ⁻³	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m ⁻³	0	0
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	3	3
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 µg m ⁻³	0	-

Produced by AEA Energy & Environment on behalf of Castlereagh BC

CASTLEREAGH DUNDONALD 01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	NO _x	NO	NO ₂	PM ₁₀ *+
Number Very High	-	-	0	0
Number High	-	-	0	0
Number Moderate	-	-	0	0
Number Low	-	-	6896	6088
Maximum 15-minute mean	1144 µg m ⁻³	654 µg m ⁻³	319 µg m ⁻³	296 µg m ⁻³
Maximum hourly mean	997 µg m ⁻³	579 µg m ⁻³	277 µg m ⁻³	125 µg m ⁻³
Maximum running 8-hour mean	682 µg m ⁻³	388 µg m ⁻³	174 µg m ⁻³	72 µg m ⁻³
Maximum running 24-hour mean	467 µg m ⁻³	254 µg m ⁻³	119 µg m ⁻³	57 µg m ⁻³
Maximum daily mean	398 µg m ⁻³	215 µg m ⁻³	104 µg m ⁻³	54 µg m ⁻³
Average	97 µg m ⁻³	38 µg m ⁻³	39 µg m ⁻³	22 µg m ⁻³
Data capture	78.7 %	78.7 %	78.7 %	69.5 %

* PM₁₀ Indicative Gravimetric Equivalent $\mu\text{g m}^{-3}$
 + PM₁₀ as measured by a TEOM using a gravimetric factor of 1.3 for Indicative Gravimetric Equivalent
 All mass units are at 20°C and 1013mb
 NO_x mass units are NO_x as NO₂ $\mu\text{g m}^{-3}$

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 $\mu\text{g m}^{-3}$	0	-
Nitrogen Dioxide	Hourly mean > 200 $\mu\text{g m}^{-3}$	2	2
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 $\mu\text{g m}^{-3}$	1	1
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 $\mu\text{g m}^{-3}$	0	-

It can be seen from the results that the PM10 and NO2 levels at the Loughview site are well below the relevant objectives. The site at Dundonald has only been operational since February 2007 and therefore has only 79% data capture. The annual average is 39 $\mu\text{g m}^{-3}$ which is close to the objective and therefore more monitoring is required.

3.3 Trends in results

Figure 7 NO2 and PM10 results 2003-2007 A55 Lough View Drive

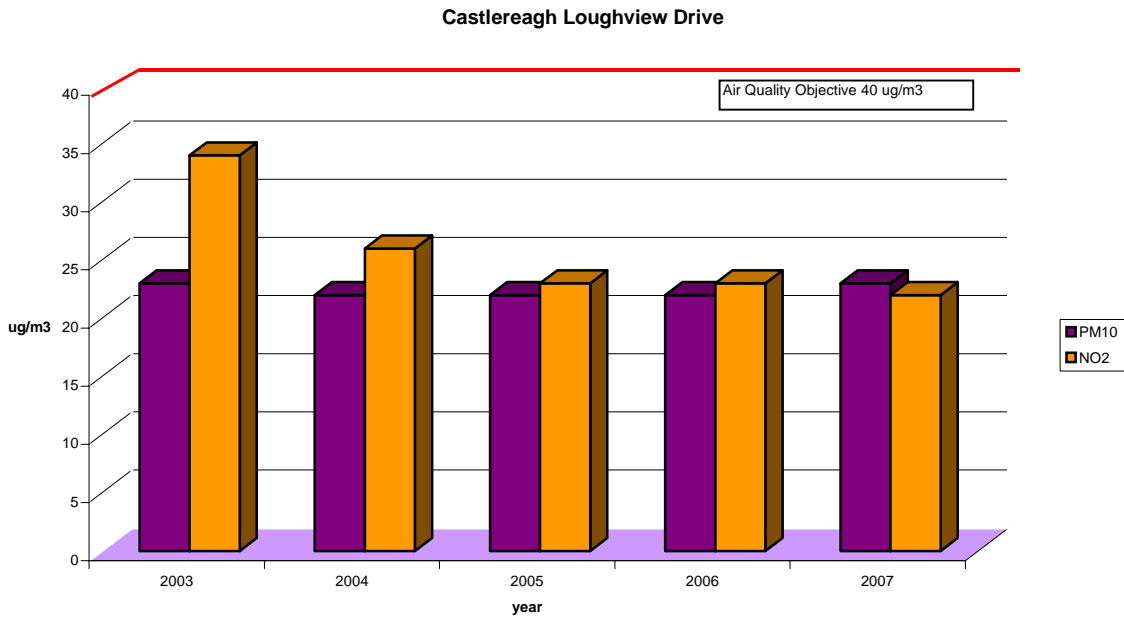
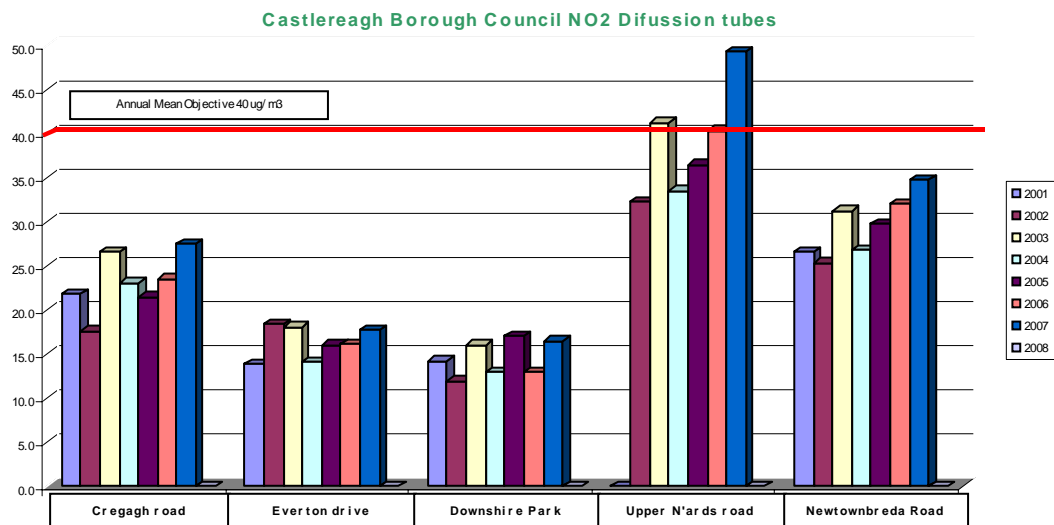


Figure 8 Castlereagh Passive NO2 Results



Castlereagh Borough Council has maintained a number of NO₂ diffusion tubes at roadside sites for a number of years. The diffusion tube studies for Castlereagh for the past five years do not show any particular trends. Annual variation is more likely to be as a result of climatic conditions rather than changes in emissions. Although the upper Newtownards Rd site is above the objective the real time analyser sited at this location is recording levels below the objective. A co-location study is now being carried out at the site.

3.4 Significant New Development

Castlereagh Borough Council has a number of housing and commercial developments under construction or planned for the area. These are as follows.

- Housing Carryduff
- Housing Castlereagh
- Housing Dundonald

A new shopping centre at Newtownbreda has been completed and further development is expected in the area.

Individually none of these developments are likely to give rise to exceedence of the objectives. However, in common with all areas within the group the cumulative effect of numerous small developments may eventually lead to objectives being exceeded.

3.5 Significant New PPC Processes

None

3.6 Summary in relation to Air quality Objectives.

None of the objectives are currently being exceeded in the Castlereagh Borough Council area. A relocation of the suburban monitoring Station at Espie Way has taken place due to the low measurement values for SO₂ and PM₁₀. PM₁₀ in this area is predominately caused by road traffic. The Station has been moved to a location at Dundonald village and combined with an NO₂ meter. This has provided useful monitoring data at this site considering the near objective indicative monitoring from NO₂ tubes at this location.

4 Down District Council

Down District Council comprises a largely rural area of around 65,000 hectares in the south east of Northern Ireland, with a population of some 66,000. The District is of rural character and the predominant wind direction is from the southwest.

Down have 10 passive NO₂ monitoring sites at the following locations.

Figure 9 Down NO₂ Sites

Site Location	Easting (Irish Grid)	Northing (Irish Grid)
7 Irish Street Downpatrick	348702	344600
5 St. Patricks Avenue Downpatrick	348542	344448
7 St. Patricks Drive Downpatrick	348605	344205
11 Orchard Way Downpatrick	348930	345903
2 Stream Street Downpatrick	348915	344207
4 Main Street Newcastle	337818	331601
Windmill Street Ballynahinch	336828	352489
16 Cross Street Killyleagh	352686	352793

4.1 Progress in the past year.

The highest annual average NO₂ recorded in the Down area 2007 is 47.4 µg/m³ at Irish Street, Downpatrick. LAQM.TG(03) states that as the annual mean is greater than 40 µg/m³ there is a need to proceed to a detailed assessment. However, due to the inaccuracies of the three No₂ Diffusion tubes and contra indications from DMRB monitoring (see results below) it is recommended that monitoring is continued and that funds be sought to install a real time analyser at or close to the relevant exposure. Suitable sites are currently being evaluated.

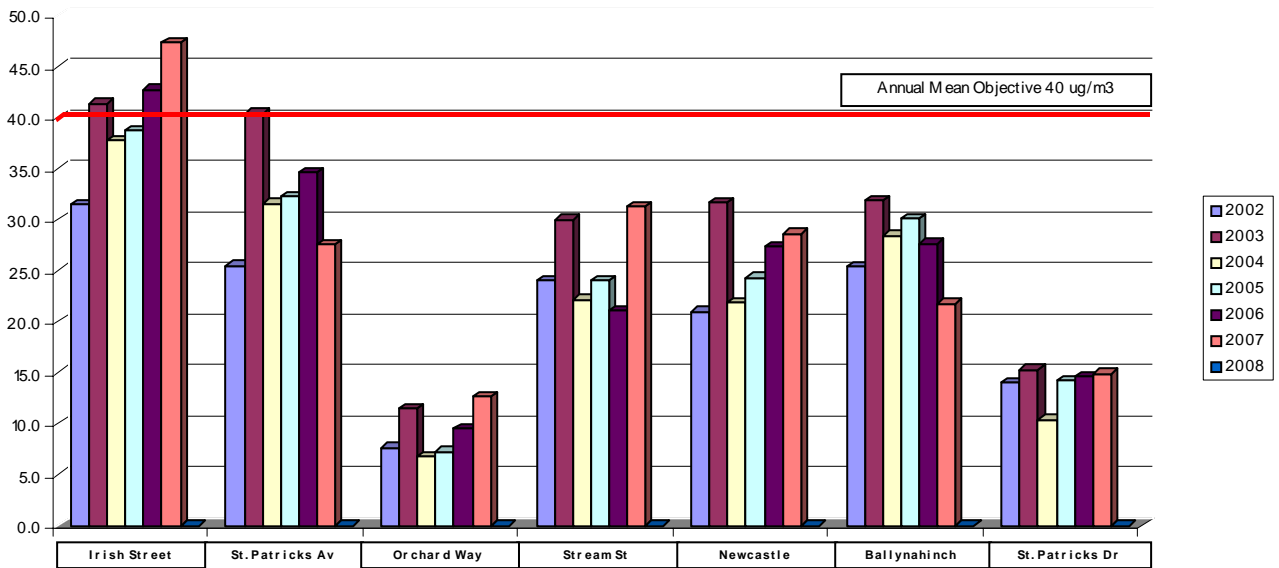
4.2 Recent Air Quality Monitoring

Down District Council has no automatic monitoring sites.

4.3 Trends in results

Figure 10 Down DC Passive NO₂ Results

Down District Council NO2 Diffusion Tubes



Down District Council has maintained a number of NO₂ diffusion tubes at roadside sites for a number of years. The diffusion tube studies for Down for the past five years are beginning to show a rising trend in relation to the levels of NO₂ at Irish Street. However it is felt that this is more due to poor precision and accuracy of the Cassella tubes see <http://www.uwe.ac.uk/aqm/review/diffusiantube290208.xls> rather than actual changes in emissions. Annual variation at other locations is more likely to be as a result of climatic conditions rather than changes in emissions.

4.4 DMRB Modelling

In order to establish some sort of feel for the high readings at the Irish Street location, DMRB screening was carried out for the Irish Street/Market Street junction. The model used was DMRB screening method V1.03c July2007. The results were as follows :-

Inputs

DMRB: Assessment of Local Air Quality						INPUT SHEET																																																																		
Step 1	Receptor name	Irish Street Downpatrick	Receptor number	1		Step 6	CALCULATE																																																																	
Step 2	Year	2007				Step 7	STORE RESULTS FOR THIS RECEPTOR																																																																	
Step 3	Number of links	2																																																																						
Step 4	Background concentrations for 2007																																																																							
	CO (mg/m ³)	Benzene (µg/m ³)	1,3-butadiene (µg/m ³)	NO _x (µg/m ³)	NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)																																																																		
	0	0	0	0	12.7	0																																																																		
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Step 5	<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th rowspan="3">Link number</th> <th rowspan="3">Distance from link centre to receptor (m)</th> <th colspan="2">Traffic flow & speed</th> <th rowspan="3">Road type (A,B,C,D)</th> <th colspan="6">Traffic composition</th> </tr> <tr> <th rowspan="2">AADT (combined, veh/day)</th> <th rowspan="2">Annual average speed (km/h)</th> <th colspan="3">Vehicles < 3.5t GVW (LDV)</th> <th colspan="3">Vehicles > 3.5t GVW (HDV)</th> </tr> <tr> <th>% passenger cars</th> <th>% light goods vehicles</th> <th>Total % LDV</th> <th>% buses and coaches</th> <th>% rigid HGV</th> <th>% articulated HGV</th> <th>Total % HDV</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3</td> <td style="text-align: center;">7950</td> <td style="text-align: center;">10</td> <td style="text-align: center;">B</td> <td></td> <td></td> <td style="text-align: center;">88</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">12</td> </tr> <tr> <td>2</td> <td>3</td> <td style="text-align: center;">5900</td> <td style="text-align: center;">10</td> <td style="text-align: center;">B</td> <td></td> <td></td> <td style="text-align: center;">88</td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">12</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							Link number	Distance from link centre to receptor (m)	Traffic flow & speed		Road type (A,B,C,D)	Traffic composition						AADT (combined, veh/day)	Annual average speed (km/h)	Vehicles < 3.5t GVW (LDV)			Vehicles > 3.5t GVW (HDV)			% passenger cars	% light goods vehicles	Total % LDV	% buses and coaches	% rigid HGV	% articulated HGV	Total % HDV	1	3	7950	10	B			88					12	2	3	5900	10	B			88					12	3												
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2	3	5900	10	B			88					12																																																												
3																																																																								

Result

NO₂ 26.5 ug/m³

Current receptor							
Receptor Name		Irish Street Downpatrick			Receptor number		1
Assessment year		2007					
Results							
Pollutant	Annual mean				For comparison with Air Quality Standards		
	Background concentration	Road traffic component	Total	Units	Metric	Value	Units
CO	0.00	0.26	0.26	mg/m ³	Annual mean *	0.26	mg/m ³
Benzene	0.00	0.22	0.22	µg/m ³	Annual mean	0.22	µg/m ³
1,3-butadiene	0.00	0.30	0.30	µg/m ³	Annual mean	0.30	µg/m ³
NO _x	0.0	53.8	53.8	µg/m ³	Not applicable		
NO ₂	12.7	13.8	26.5	µg/m ³	Annual mean *	26.5	µg/m ³
PM ₁₀	0.0	6.51	6.51	µg/m ³	Annual mean	6.5	µg/m ³
					Days > 50 µg/m ³	0	Days

4.5 Significant New Development

None.

4.6 Significant New PPC Processes

None.

4.7 Summary in relation to Air quality Objectives.

Diffusion tube monitoring indicates that the annual average objective for NO₂ is being exceeded at the Irish street location in Downpatrick. However, levels in relation to the tubes are suspect due to poor precision and accuracy. Tube levels in relation to all of the councils in the Eastern group have been elevated this year, a situation that isn't reflected in the results from the automatic monitoring stations (see fig?). Down District Council will continue to keep a watching brief in relation to NO₂ levels at the Irish Street Junction, as there is now relevant exposure at this location. Down DC officers are evaluating sites with a view to installing real time monitoring equipment.

5 Lisburn City Council

Lisburn City Council is located southwest of Belfast. It spans 174 square miles of southwest Antrim and northwest Down and stretches from Glenavy and Dundrod in the north to Dromara and Hillsborough in the south and from Drumbo in the east to Moira and Aghalee in the west. The population of the area is over 108,000. The Borough is of mixed and urban rural character and the predominant wind direction is from the southwest.

Lisburn City's automatic air quality monitoring sites are located at Lagan Valley Hospital on the A1, at the Council, Island Civic Centre and at Dunmurry High School

Lisburn has 9 NO₂ diffusion tube sites at the following locations.

Figure 11 Lisburn Passive NO₂ Sites

Site Location	Easting (Irish Grid)	Northing (Irish Grid)
Northern Bank 62 Bow Street Lisburn	326507	364415
Antrim Road Lisburn	326313	364621
22 Ventnor Park Lambeg	326900	362013
75 Edgewater Lisburn	327202	363718
Main Street Moira	315100	360621
18 Kingsway Dunmurry	329502	386915
10 Beechlawn Park Dunmurry	329610	369105
9 Sprucefield Court Lisburn	326165	362491
18 Benford Park Lisburn	327586	363586

5.1 Progress in the Past Year

While currently outside the remit of the Air Quality objectives, previous monitoring has indicated elevated Poly aromatic hydrocarbon levels in the Area. Lisburn City council has obtained grant, installed two PAH meters to acquire daily PAH measurements in the area, with a view to isolating the source.

5.2 Recent Air Quality Monitoring

PM₁₀ and NO₂ results for the Lisburn City Council Area are well within current objectives without an emerging pattern as to whether measured levels are rising or falling. SO₂ readings at the Dunmurry location have been low in common with all SO₂ measurements throughout the Eastern group area. The monitor was moved from its Civic Island site in Lisburn in order to inform the ongoing measurements in relation to PAH.

Figure 12 Lisburn Dunmurry PM10 2003-2007

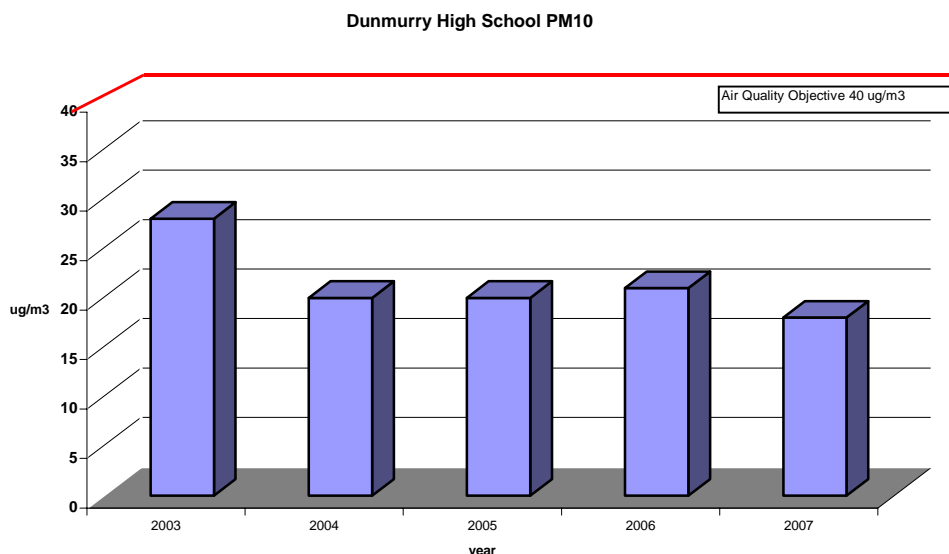


Figure 13 Lisburn Dunmurry Automatic Monitoring Results 2007

Produced by AEA Energy & Environment on behalf of Lisburn CC

LISBURN DUNMURRY HIGH SCHOOL

01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	SO ₂	PM ₁₀ *+
Number Very High	0	0
Number High	0	0
Number Moderate	0	38
Number Low	32731	8395
Maximum 15-minute mean	48 µg m ⁻³	207 µg m ⁻³
Maximum hourly mean	32 µg m ⁻³	170 µg m ⁻³
Maximum running 8-hour mean	25 µg m ⁻³	142 µg m ⁻³
Maximum running 24-hour mean	17 µg m ⁻³	78 µg m ⁻³
Maximum daily mean	12 µg m ⁻³	74 µg m ⁻³
Average	3 µg m ⁻³	18 µg m ⁻³
Data capture	95.5 %	96.1 %

* PM₁₀ Indicative Gravimetric Equivalent µg m⁻³

TEOM FDMS from 19 December 2007 to 31 December 2008

All other data are corrected TEOM which has a factor of 1.3 applied giving Indicative Gravimetric Equivalent

All mass units are at 20°C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 µg m ⁻³	0	0
Sulphur Dioxide	Hourly mean > 350 µg m ⁻³	0	0
Sulphur Dioxide	Daily mean > 125 µg m ⁻³	0	0
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	5	5
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 µg m ⁻³	0	-

Figure 14 Lisburn Island Civic Centre PM10 Results 2003-2007

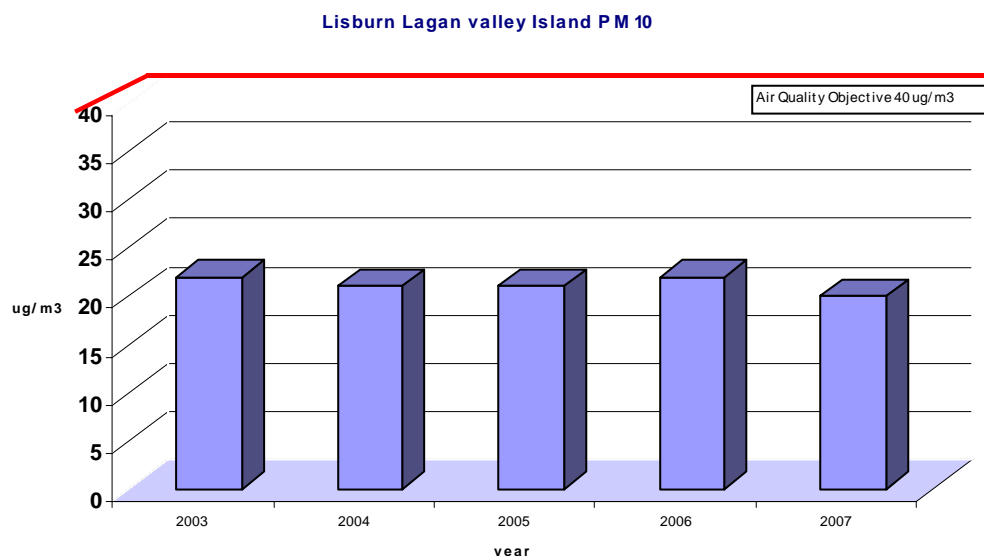


Figure 15 Lisburn Island Civic Centre Automatic Results 2007

Produced by AEA Energy & Environment on behalf of Lisburn CC

LISBURN ISLAND CIVIC CENTRE 01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	PM ₁₀ * +
Number Very High	0
Number High	0
Number Moderate	11
Number Low	8749
Maximum 15-minute mean	191 µg m ⁻³
Maximum hourly mean	126 µg m ⁻³
Maximum running 8-hour mean	99 µg m ⁻³
Maximum running 24-hour mean	67 µg m ⁻³
Maximum daily mean	65 µg m ⁻³
Average	20 µg m ⁻³
Data capture	99.6 %

* PM₁₀ Indicative Gravimetric Equivalent µg m⁻³

+ PM₁₀ as measured by a TEOM using factor of 1.3 to give Indicative Gravimetric Equivalent
All mass units are at 20°C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	4	4
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 µg m ⁻³	0	-

Figure 16 A1 Lagan Valley Hospital PM10 and NO2 Results 2003-2007

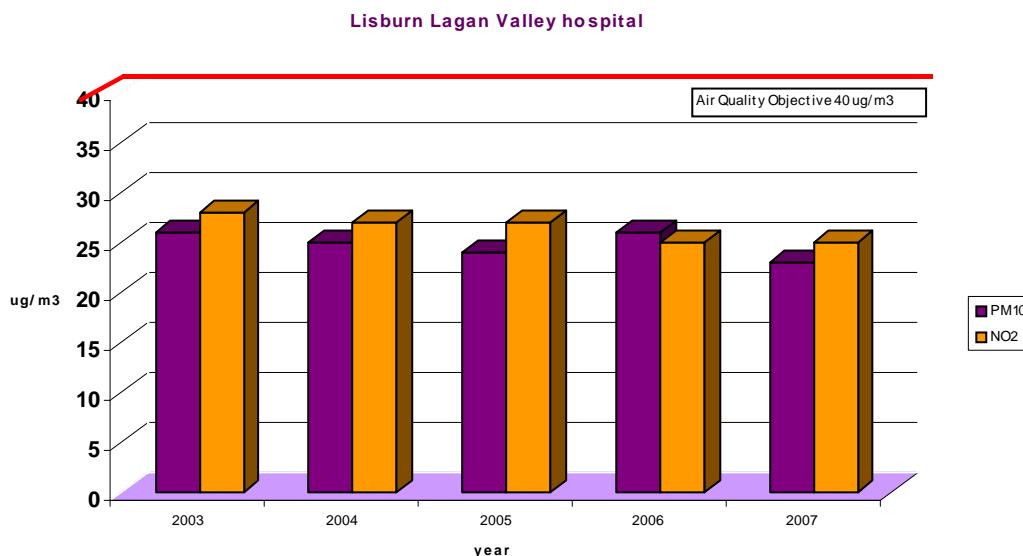


Figure 17 Lagan Valley Hospital Automatic Results 2007

Produced by AEA Energy & Environment on behalf of
LISBURN LAGAN VALLEY HOSPITAL
01 January to 31 December 2006
 These data have been fully ratified by AEA Energy & Environment

POLLUTANT	NO ₂	PM ₁₀	GR ₁₀
Number Very High	0	0	-
Number High	0	0	-
Number Moderate	0	97	-
Number Low	8634	8081	-
Maximum 15-minute mean	208 µg m ⁻³	297 µg m ⁻³	386 µg m ⁻³
Maximum hourly mean	178 µg m ⁻³	202 µg m ⁻³	263 µg m ⁻³
Maximum running 8-hour mean	100 µg m ⁻³	112 µg m ⁻³	146 µg m ⁻³
Maximum running 24-hour mean	80 µg m ⁻³	65 µg m ⁻³	84 µg m ⁻³
Maximum daily mean	75 µg m ⁻³	56 µg m ⁻³	73 µg m ⁻³
Average	25 µg m ⁻³	20 µg m ⁻³	26 µg m ⁻³
Data capture	98.6 %	93.0 %	93.0 %

PM₁₀ is measured with a TEOM instrument.

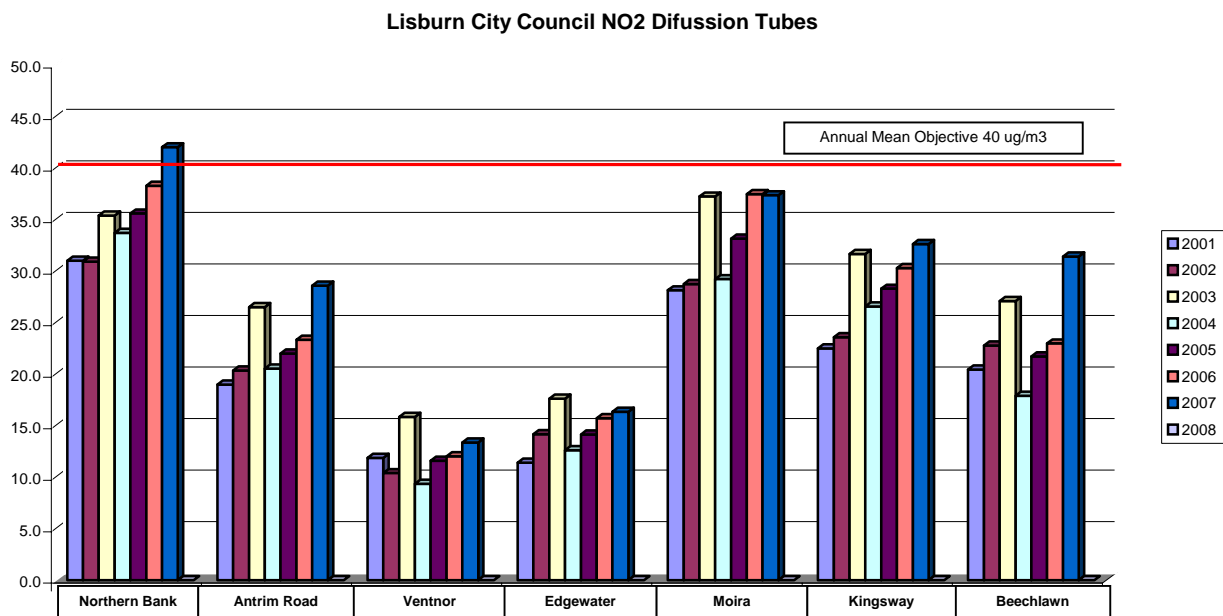
GR₁₀ is the PM₁₀ data converted to 'Gravimetric Equivalent' units using a conversion factor of 1.3

All mass units are at 20°C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m ⁻³	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m ⁻³	0	0
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	18	18
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 µg m ⁻³	0	-

5.3 Trends in results

Lisburn City Council has maintained a number of NO₂ diffusion tubes at roadside sites for a number of years. The diffusion tube studies for Lisburn for the past five years do not show any particular trends. Only the Northern Bank site shows an exceedance of the objective. However, this is a historical kerb side site without relevant exposure. Annual variation is more likely to be as a result of climatic conditions rather than changes in emissions. All other monitoring has shown results well below the current objectives. In common with the rest of the Eastern Group NO₂ levels for 2007 in relation to diffusion tubes appear to be elevated. We think that this may be a measurement aberration for reasons previously discussed.



5.4 Significant New Development

None.

5.5 Significant New PPC Processes

None.

5.6 Summary in Relation to Air Quality Objectives.

It continues to be the case that no current air quality objectives are being exceeded in the Lisburn City Council area. PAH levels are being monitored in Dunmurry as earlier studies have indicated elevated levels of this pollutant.

6 North Down Borough Council

The Borough of North Down is geographically one of the smallest Council areas in Northern Ireland. Population has increased steadily over recent years and is now in the region of 78,000.

Air quality in North Down is generally good as there is good ventilation from sea breezes. There are few industrial processes in the area that are significantly detrimental to air quality and heavy fuel oil is not widely used for heat generation.

There is significant use of solid fuel within the Borough for domestic heating. There are a number of very busy trunk roads in the area

North Down Borough Council's air quality monitoring sites are located at Clandeboye Road, Bangor and at the side of the A2 in Holywood.

The Bangor site is in an area of high density housing with a significant proportion of solid fuel burning. A fuel use survey was completed in May 2002, in the most densely populated 1Km² within the Borough that comprised 1677 dwellings. This Survey indicated that 14% of households used coal as a sole heating source roughly 59 houses per 500m², with a further 22% (98 houses per 500m²) using coal as a secondary means of heating.

The site in Holywood is located at the A2 in the vicinity of Marine Parade. Approximately this area has a AADT flow of 48,500 vehicles with a low HGV component of roughly 3%.

Nine NO₂ diffusion tubes are mounted at the following locations to monitor roadside emissions.

Figure 18 North Down Passive NO₂ Monitoring Sites

Site Location	Easting (Irish Grid)	Northing (Irish Grid)
Ava Bar Main Street Bangor	350402	381521
Kosmos Bingham Street Bangor	350707	381905
1 Rathmore Road Bangor West	348300	381526
17 Rathgael Rd A2 Bangor	347872	380052
163 Rathgael Rd A21 Bangor	349491	379505
Ballyrobert A2	345002	380823
Seahill A2	343545	381102
Cultra A2	342475	380672
Marine Parade Holywood A2	339600	379229

In addition, three tubes are co-located at the A2 Holywood.

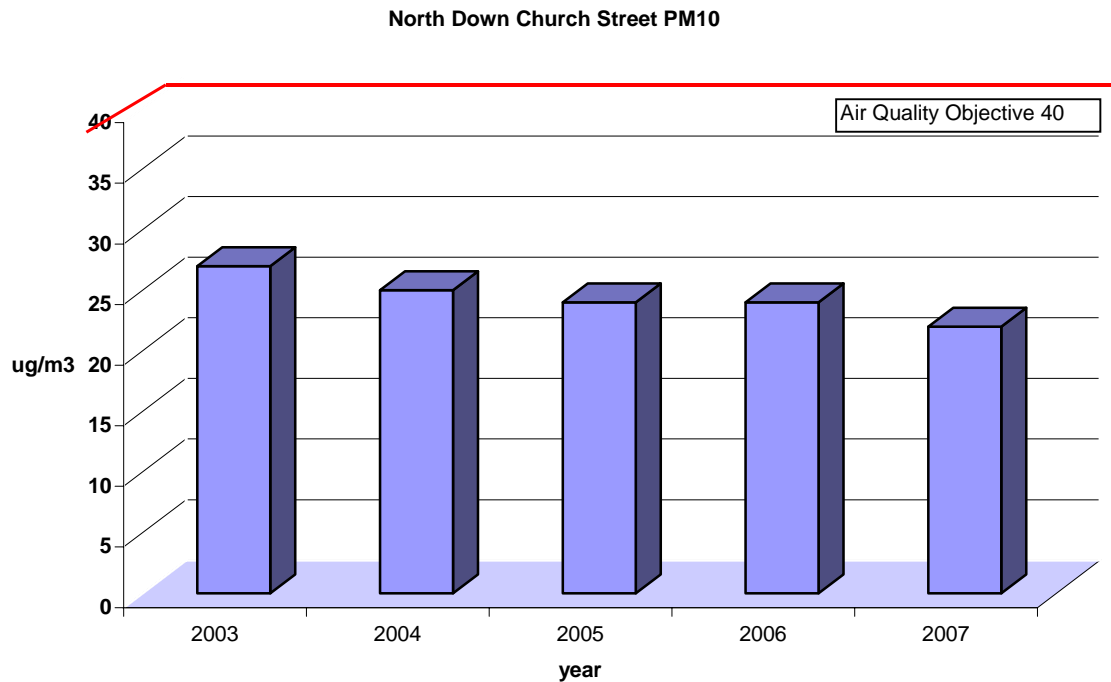
6.1 Progress in the past year.

The Updating and Screening Assessment completed in 2006 indicated that current objectives in relation to SO₂ NO₂ and PM₁₀ would be achieved. The measured levels of SO₂ at Clandeboye Road continue to be extremely low.

Monitoring has been retained, as coal burning in the area has increased due to the doubling of heating oil prices in the past year. It is thought that this might be reflected in increased PM¹⁰ and SO₂ levels.

6.2 Recent Air Quality Monitoring

Figure 19 North Down Bangor PM10 2003-2007



There appears to be a slight downward trend in relation to average annual PM₁₀ levels at the North Down Bangor site. This is possibly associated with reduced reliance on solid fuel for heating in the area as older housing is refurbished and coal fires are replaced with gas and oil. However, the weather in the past year was characterised by wind and rain, which halved the number of exceedance days from the previous year. It is thought that coal burning may increase in this area over the next year due to elevated domestic heating oil prices.

Figure 20 North down Bangor Automatic Results 2007

Produced by AEA Energy & Environment on behalf of North Down BC

NORTH DOWN BANGOR 01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	SO ₂	PM ₁₀ *+
Number Very High	0	0
Number High	0	0
Number Moderate	0	45
Number Low	33138	8631

Maximum 15-minute mean	77 $\mu\text{g m}^{-3}$	458 $\mu\text{g m}^{-3}$
Maximum hourly mean	51 $\mu\text{g m}^{-3}$	189 $\mu\text{g m}^{-3}$
Maximum running 8-hour mean	33 $\mu\text{g m}^{-3}$	116 $\mu\text{g m}^{-3}$
Maximum running 24-hour mean	20 $\mu\text{g m}^{-3}$	86 $\mu\text{g m}^{-3}$
Maximum daily mean	18 $\mu\text{g m}^{-3}$	79 $\mu\text{g m}^{-3}$
Average	4 $\mu\text{g m}^{-3}$	22 $\mu\text{g m}^{-3}$
Data capture	96.7 %	98.4 %

* PM₁₀ Indicative Gravimetric Equivalent $\mu\text{g m}^{-3}$
+ PM₁₀ as measured by a TEOM using a gravimetric factor of 1.3 for Indicative Gravimetric Equivalent
All mass units are at 20°C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 $\mu\text{g m}^{-3}$	0	0
Sulphur Dioxide	Hourly mean > 350 $\mu\text{g m}^{-3}$	0	0
Sulphur Dioxide	Daily mean > 125 $\mu\text{g m}^{-3}$	0	0
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 $\mu\text{g m}^{-3}$	8	8
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 $\mu\text{g m}^{-3}$	0	-

Figure 21 North Down Holywood A2 NO2 and PM10 Results 2003-2007

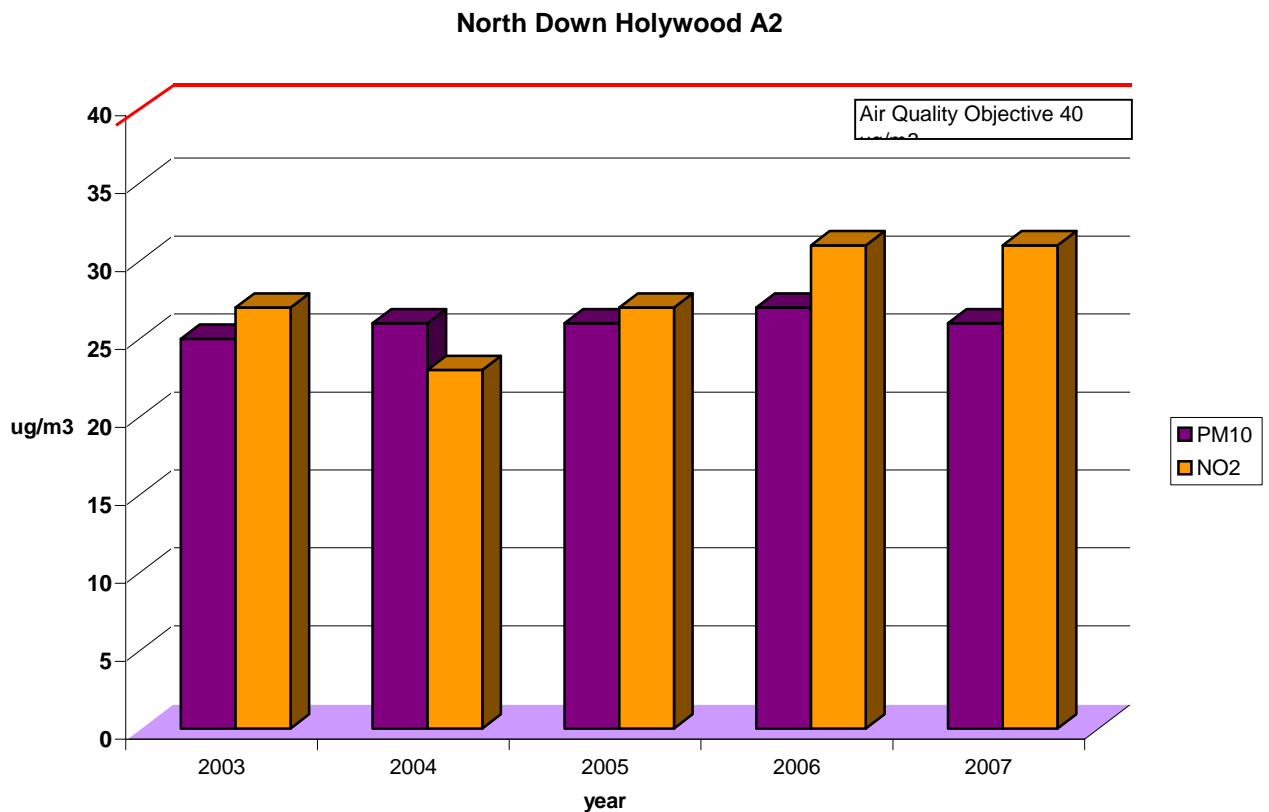


Figure 22 North Down Holywood A2 Results 2007

Produced by AEA Energy & Environment on behalf of
North Down Borough Council

Produced by AEA Energy & Environment on behalf of North Down BC

NORTH DOWN HOLYWOOD A2 01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	NO _x	NO	NO ₂	PM ₁₀ *+
Number Very High	-	-	0	0
Number High	-	-	0	0
Number Moderate	-	-	0	94
Number Low	-	-	7959	8557
Maximum 15-minute mean	940 µg m ⁻³	490 µg m ⁻³	201 µg m ⁻³	2282 µg m ⁻³
Maximum hourly mean	865 µg m ⁻³	460 µg m ⁻³	162 µg m ⁻³	628 µg m ⁻³
Maximum running 8-hour mean	444 µg m ⁻³	223 µg m ⁻³	116 µg m ⁻³	113 µg m ⁻³
Maximum running 24-hour mean	297 µg m ⁻³	131 µg m ⁻³	97 µg m ⁻³	90 µg m ⁻³
Maximum daily mean	272 µg m ⁻³	123 µg m ⁻³	86 µg m ⁻³	83 µg m ⁻³
Average	70 µg m ⁻³	25 µg m ⁻³	31 µg m ⁻³	26 µg m ⁻³
Data capture	90.9 %	90.9 %	90.9 %	98.5 %

* PM₁₀ Indicative Gravimetric Equivalent µg m⁻³

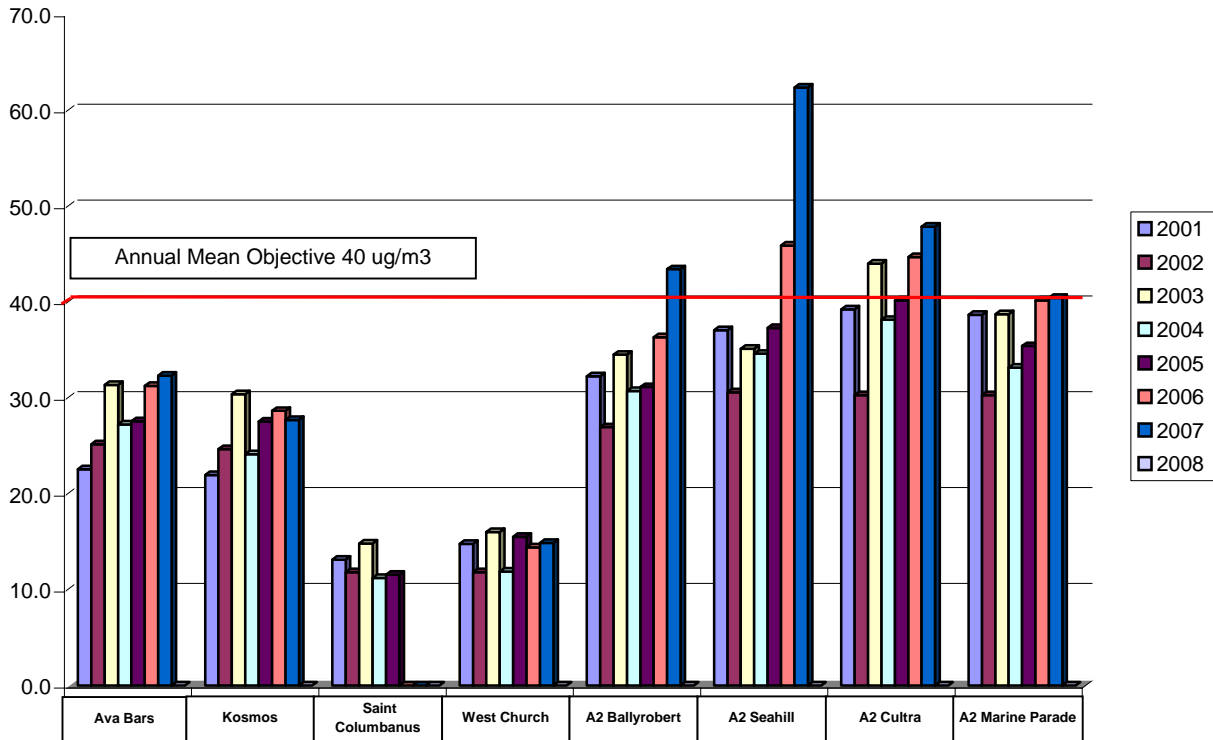
+ PM₁₀ as measured by a TEOM using a gravimetric factor of 1.3 for Indicative Gravimetric Equivalent

All mass units are at 20°C and 1013mb
NO_x mass units are NO_x as NO₂ µg m⁻³

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m ⁻³	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m ⁻³	0	0
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	13	13
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 40 µg m ⁻³	0	-

6.3 Trends in results

North Down Borough Council NO₂ Diffusion Tubes



Automatic station and passive diffusion tube site results in relation to the A2 from Bangor to Holywood are showing a significant increase in NO₂ while PM₁₀ Levels have remained fairly constant. This is not consistent with results from the real time analyser positioned on the A2 which has remained consistently below the objective for a number of years.

The Co-located study at the automatic site Marine Parade Holywood, indicates that the correction factor applicable to local conditions is 0.52

<http://www.uwe.ac.uk/aqm/review/diffusiontube290208.xls>

This is significantly different than the bias factor derived from the combination of co-located studies of 0.92 applied to the above graph. If the local factor were applied to the readings at the A2 Seahill the reading would come in significantly below the objective. In order to reduce the effects of spurious reading for the A2 roadside sites all of the tube sites on the A2 have triplicate tubes. In addition, the tubes at Seahill have been relocated to the side of the closest relevant exposure, which is a dwelling house.

6.4 Significant New Development

None.

6.5 Significant New PPC Processes

None.

6.6 Summary in Relation to Air Quality Objectives

Last year's diffusion tube data indicated that the annual objective for NO₂ was being exceeded at the A2 Seahill site. This does not tally with the readings from the automatic site. The monitoring method for this site is being altered in order to make the measurements more representative. For PM¹⁰ average annual levels were similar to previous years. However, daily exceedances (days over 50ugm-3 PM₁₀) were much reduced presumably due to the predominantly wet windy weather from May to December 2007.

7 Overall Conclusion

Monitoring indicated that the current air quality objective for NO₂ is being exceeded in Down District Council and North Down Borough Council areas. It is suspected that these exceedances may be as a result of poor accuracy and precision in relation to the NO₂ Tubes used rather than actual exceedances and both councils have taken appropriate steps in order to try and clarify the readings.

As mentioned last year, all areas are subject to the cumulative effect of small-scale infill development. Individually this type of development does not have a significant effect, but cumulatively the effect can be considerable, particularly in the North Down, Ards Castlereagh, and Lisburn areas, where this type of development often houses Belfast commuters. Therefore, local roads and feeder roads to the main trunk roads become more congested leading to a rise in pollutants.

Recently this has been offset by an increasing proportion of EURO 3 and EURO 4 compliant vehicles on the roads. However, the gains from vehicle emissions reductions is diminishing and increased vehicle numbers and congestion on the main Belfast Arterial routes may lead to future exceedances in relation to NO₂ and PM₁₀.

Another recent development that may act against continued improvements in Air Quality is the considerable increase in the price of domestic heating oil. While most homes in the eastern group are heated using oil over half have coal appliances to provide secondary heating. Only Castlereagh BC has extensive Smoke Control Areas. This feature of the Eastern Group area may become significant if coal burning continues to grow.

8 References

1. Progress Report Guidance LAQM.PRGNI(04) November 2004
2. Technical Guidance LAQM.TG(03) January 2003.
3. LAQM.TG(03) – Update. January 2006.
4. The Air Quality Regulations NI (2003)
5. DETR (2000) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Department of the Environment, Transport and the Regions. Cm 4548, SE 2000/3, NIA 7
6. Eastern Group fuel use survey 2003.