



## ***Belfast City Council Progress Report To the Environment and Heritage Service.***



***September 2005.***

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## Introduction.

In 2003, The Environment and Heritage Service published the Local Air Quality Management Policy Guidance document, LAQM.PGNI(03) in which, it outlined a submission timetable for those local authorities engaged in the air quality management process. The policy document requires that district councils complete and submit a progress report to the Department by April 2005, which summarises the outcome of ongoing ambient air quality monitoring programmes and which also identifies potential new local developments or processes that may have a detrimental impact upon air quality. The following document is submitted in response to the requirement for an Air Quality Progress Report.

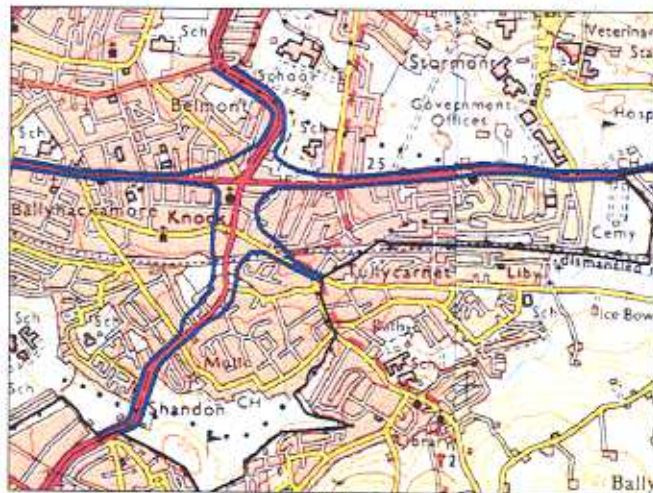
## Context

In August 2004, Belfast City Council, having completed the first round of its air quality review and assessment process, declared four area quality management areas across Belfast associated with road transport. Predictive atmospheric dispersion modelling studies had indicated that the annual mean nitrogen dioxide national air quality strategy objective was likely to be exceeded adjacent to the Ormeau Road, Upper Newtownards Road, Cromac Street towards Short Strand and along the Westlink corridor during 2005. The hourly mean objective for nitrogen dioxide was also expected to be exceeded along the Westlink corridor in 2005. Additionally, dispersion modelling also indicated that the annual and daily mean National Air Quality Strategy Objectives for particulate matter (PM<sub>10</sub>) would also be exceeded along the Westlink corridor during the strategy compliance year of 2004. The four air quality management areas are summarised in the following figures.





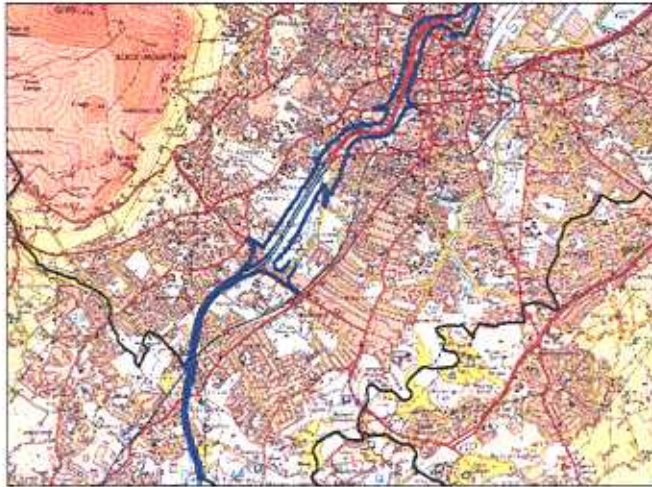
### Upper Newtownards Road Air Quality Management Area.



Cromac Street / Markets / Short Strand Air Quality Management Area.



## Westlink Corridor Air Quality Management Area.



### Content of the progress report.

In November 2004, the Environment and Heritage Service published a document entitled Progress Report Guidance LAQM.PRGNI(04), which outlined the purpose of progress reports and detailed their required contents. Therefore, having regard to the guidance, a progress report should, as a minimum, include progress on the implementation of local air quality management and furthermore summarise progress towards achieving the relevant national air quality strategy objectives. The guidance suggests that these requirements can best be achieved by addressing ambient monitoring data and those local developments, which might impact upon local air quality.

Furthermore, the guidance document also recommends that additional local authority measures leading to the achievement of the National Air Quality Strategy Objectives should also be included within the report. These might include:-

- Progress on the implementation of action plans.
- An assessment of monitoring data in relation to likely exceedences of the National Air Quality Strategy Objectives.
- Progress on the formulation of local air quality strategies.
- Those planning applications that may have an impact upon local air quality.
- Details of transportation measures implemented or proposed in accordance with the Regional Transportation Strategy for Northern Ireland 2002 – 2012 and its Transport Plan.



## **Section 1 - Ambient Monitoring Programmes.**

Belfast City Council operates a range of ambient monitoring equipment throughout the City to enable determination of those locations where the National Air quality Strategy Objectives might be exceeded. The current monitoring regime is summarised as follows:-

### **Automatic Monitoring Sites.**

#### ***Automatic Urban and Rural Network - Lombard Street.***

Pollutants monitored	-	SO <sub>2</sub> , NO <sub>2</sub> , CO, O <sub>3</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , benzene, 1,3-butadiene.
Equipment employed:-		
Sulphur dioxide	-	Monitor Labs 9800 UV Fluorescence Analyser.
Nitrogen dioxide	-	Monitor Labs 9841 Chemiluminescence Analyser.
Carbon Monoxide	-	Monitor Labs 9830 NDIR Analyser.
Ozone	-	Monitor Labs 9810 UV Analyser.
PM <sub>10</sub>	-	Rupprecht & Patashnick TEOM 1400a/b.
PM <sub>2.5</sub>	-	Rupprecht & Patashnick Partisol 2025/
Benzene / 1,3-butadiene	-	NPL pumped sampler with GCMS.

#### ***Belfast East Automatic Urban and Rural Network – Templemore Avenue.***

Pollutants monitored	-	SO <sub>2</sub> .
Equipment employed	-	Advanced Pollution Instruments Model 100E Chemiluminescence Analyser.

#### ***Belfast East Automatic Urban and Rural Network – Clara Street.***

Pollutants monitored	-	PM <sub>10</sub> , polycyclic aromatic hydrocarbons.
Equipment employed:-		
PM <sub>10</sub>	-	Met One Instruments Beta Attenuation Monitor Model 1020
PAHs	-	Graseby-Anderson high volume sampler with GCMS.

#### ***Belfast City Council roadside monitor - Westlink.***

Pollutants monitored	-	NO <sub>2</sub> , PM <sub>10</sub> .
Equipment employed:-		
Nitrogen dioxide	-	Advanced Pollution Instruments Model 200E Chemiluminescence Analyser.
PM <sub>10</sub>	-	Rupprecht & Patashnick TEOM 1400a/b.

#### ***Belfast City Council roadside monitor - Upper Newtownards Road.***

Pollutants monitored	-	NO <sub>2</sub> , benzene, 1,3-butadiene.
Equipment employed:-		
Nitrogen dioxide	-	Advanced Pollution Instruments Model 200E Chemiluminescence Analyser.
Benzene / 1,3-butadiene	-	NPL pumped sampler with GCMS.

#### ***Belfast City Council railway monitor - Ivan Street.***

Pollutants monitored	-	SO <sub>2</sub> .
Equipment employed	-	Advanced Pollution Instruments Model 100E Chemiluminescence Analyser.

#### ***Non-automatic Monitoring Sites.***

8-port bubbler apparatus for monitoring black smoke and sulphur dioxide.

Templemore Avenue.

Dufferin Road

Belfast City Hall.

Stranmillis Road.

Whitewell Road

Shankill Road

### **Passive Sampler Sites.**

Diffusion tubes for monitoring nitrogen dioxide located at both roadside and background sites. The tubes are exposed for successive four-week periods at all locations.

### **Background sites.**

Royal Victoria Hospital.

North Road.

### **Roadside Sites.**

Upper Newtownards Road (co-located with the automated nitrogen dioxide monitor).

Westlink (co-located with the automated nitrogen dioxide monitor).

Lombard Street (co-located with the automated nitrogen dioxide monitor).

Blacks Road.

Cromac Street.

Short Strand.

Donegal Square South.

Milner Street.

301 Ormeau Road.

400 Ormeau Road.

East Bridge Street

Great Georges Street.

Lisburn Road.

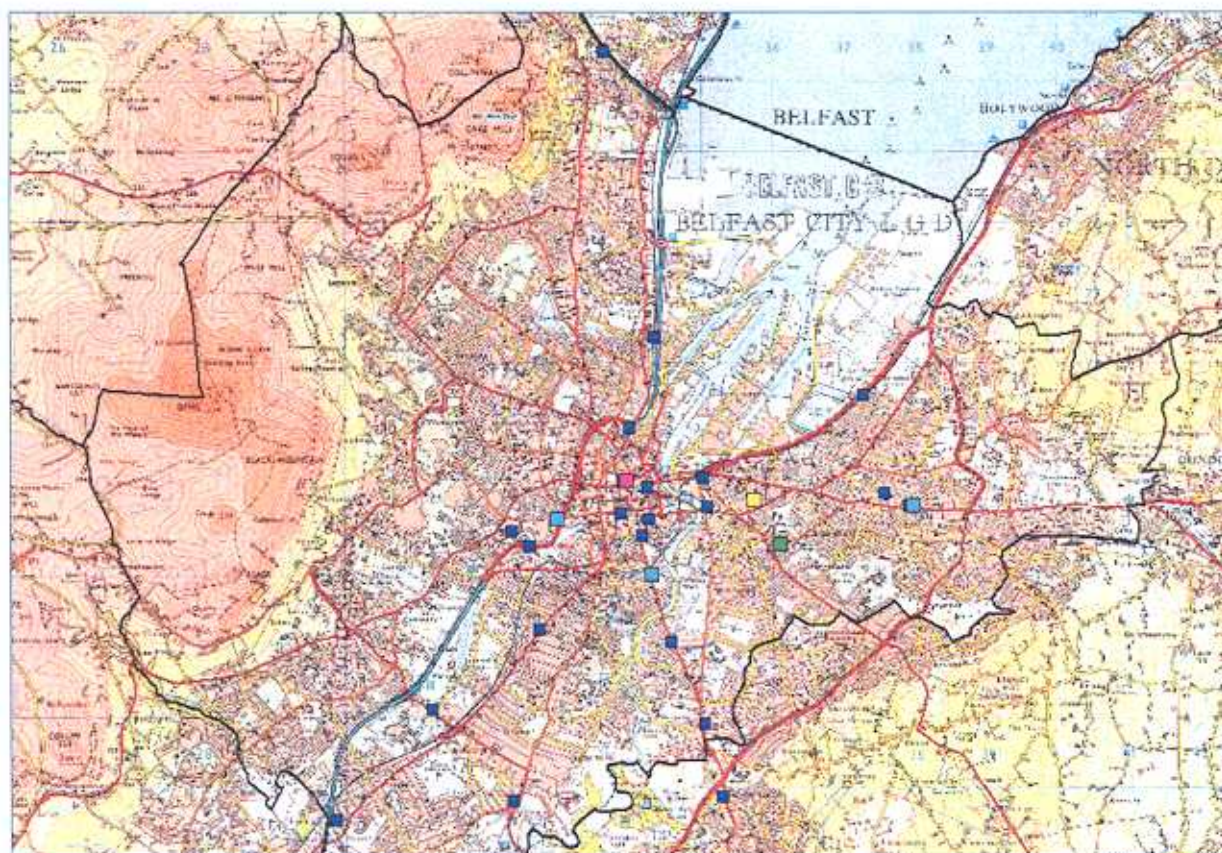
Stockmans Lane.

Whitewell Road.

Ivan Street (at site of sulphur dioxide monitor).



The following map illustrates the location of monitoring sites across Belfast:-



- |                                      |   |   |
|--------------------------------------|---|---|
| Lombard Street AURN site             | - | ■ |
| Roadside automated sites             | - | ■ |
| Clara Street AURN site               | - | ■ |
| Templemore Avenue AURN site          | - | ■ |
| NO <sub>2</sub> diffusion tube sites | - | ■ |

### **Quality Assurance and Quality Control Measures Implemented to Ensure Data Integrity.**

Those sites, which form part of the Automated Urban and Rural Network, are subject to rigorous quality assurance and controls involving the biweekly calibration by local site operators, six monthly ratification of equipment by AEA Technology (NETCEN) and service support by equipment support units. Belfast City Council officers have operated the AURN sites within Belfast since 1989 and consequently have extensive experience in the use of the operation of air quality monitoring equipment and obtaining the highest data acquisition rates.



Belfast City Council applies quality assurance and control measures similar to those employed by DEFRA in the operation of its own ambient monitoring equipment. The methodology was extensively outlined in the 3<sup>rd</sup> stage of the review and assessment report and therefore, it is not proposed to describe it in detail at this juncture. Nonetheless, it should be noted that Belfast City Council monitoring sites are part of the NETCEN Calibration Club and as such are validated using procedures equivalent to those employed within AURN Network. The analysers are also calibrated by the local site operator on a bi-weekly basis and supported by a full equipment support unit service and maintenance contract. To date, NETCEN reports have concluded that the ambient monitoring data is appropriate for use in the review and assessment of air quality and that the monitoring equipment consistently complies with all AURN network operational parameters.

Data from the non-automatic samplers such as 8-port analysers is also ratified by AEA Technology NETCEN.

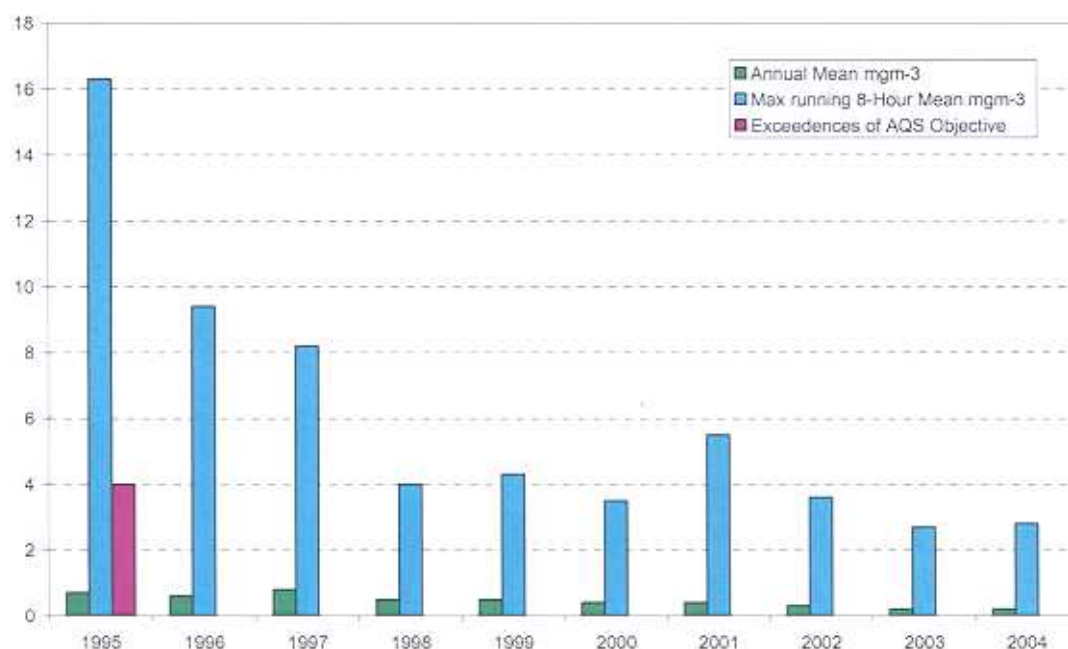
Passive diffusion tubes are obtained from Lambeth Scientific Services and employ a 50%TEA / 50% Acetone solution for measuring nitrogen dioxide levels. The diffusion tubes monitoring data is subsequently corrected using calibration data obtained from triplicate co-location studies with automated equipment.

## **A Review of Ambient Monitoring Data.**

### **Carbon monoxide.**

There were no recorded exceedences on the 8-hour running mean  $> 10 \text{ mgm}^{-3}$  recorded at the Belfast Centre site during 2004. The maximum-recorded 8-hour running mean was  $2.8 \text{ mgm}^{-3}$ , significantly below the National Air quality Strategy Objective of  $10 \text{ mgm}^{-3}$ . The data recorded during 2004 continues the downward trend in ambient carbon monoxide concentrations recorded within Belfast and the following graph illustrates this declining trend in annual and maximum 8-hour means over recent years coupled with decreasing exceedences of the air quality strategy objective.

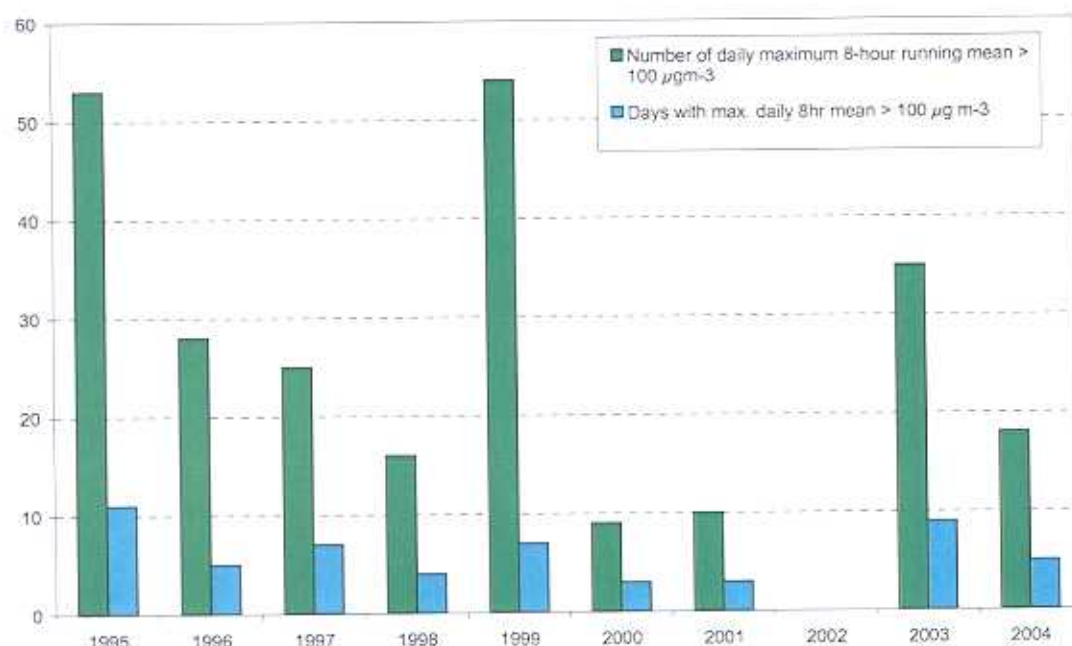




## Ozone.

When the National Air Quality Strategy was originally published in 1997, ozone was omitted from the list of ambient pollutants prescribed within the Air Quality Regulations. However, in 2002 the 3<sup>rd</sup> Daughter Directive established a limit value for ozone of  $120\mu\text{gm}^{-3}$  (not to be exceeded on more than 25 days per calendar year) averaged over three years measured as a maximum daily 8-hour mean and consequently in 2003, the Department of Environment introduced the Air Quality (Ozone) Regulations (Northern Ireland) 2003. The Northern Ireland regulations established a more stringent maximum daily running 8-hour mean of  $100\mu\text{gm}^{-3}$  (not to be exceeded on more than 10 days per annum) to be achieved by the 31<sup>st</sup> December 2005.

Ozone has been monitored at the Belfast Centre Lombard Street site since 1992 and since that time, no clear trends have emerged however, it must be noted that since ozone is a transboundary pollutant, other countries may have the capacity to contribute to local monitored levels. The following graph illustrates exceedences of the maximum daily running 8-hour mean  $100\mu\text{gm}^{-3}$  and number of days the air quality strategy objective at the Belfast Centre site since 1995. No exceedence of the air quality strategy objective has been recorded at the Belfast Centre site since 1995.



### Sulphur dioxide.

Historically, there has been a reliance upon solid fuel for domestic heating within Belfast, however, in recent years the widespread uptake of natural gas throughout both the industrial and domestic sectors has caused ambient sulphur dioxide levels to significantly decline. Indeed, in the recently completed air quality review and assessment, Belfast City Council concluded that impact of natural gas would result in no exceedences of any air quality objective for sulphur dioxide at relevant locations in either of 2004 or 2005 compliance years.

Within the National Air Quality Strategy, the Department has established a number of objectives for sulphur dioxide ranging from a 15 minute mean of  $266\mu\text{gm}^{-3}$  (not to be exceeded more than 35 times per annum), to a 1 hour mean of  $350\mu\text{gm}^{-3}$  (not to be exceeded more than 24 times per annum, to a 24 hour mean of  $125\mu\text{gm}^{-3}$  (not to be exceeded more than 3 times per annum). The 15-minute and 1-hour means can only adequately be assessed using automated monitors such as those located at Lombard Street and Templemore Avenue whereas exceedences of the 24 hour mean objective can be investigated at both automated and 8-Port sites. A review of the Belfast monitoring data for 2004 indicates that there were no recorded exceedences of any sulphur dioxide air quality objective at any monitoring site. The following graph illustrates the daily means recorded by automated analysers at Lombard Street and Templemore Avenue sites during 2004.





However, in accordance with the requirements of the Review and Assessment technical guidance document LAQM.TG(03), Belfast City Council also identified a location adjacent to a train maintenance yard in Ivan Street where exceedences of sulphur dioxide short-term objective could potentially occur. The guidance indicates that idling trains can emit significant quantities of sulphur dioxide from their exhausts, which may result in localised exceedences of the sulphur dioxide 15 minute mean objective. In order to assess the likelihood of train emissions causing such a problem, Belfast City Council installed an automated analyser in Ivan Street for a period of six months to cover the winter period October 2004 – March 2005. Although the analyser was in operation for a relatively short period, the monitoring data was quality assured in accordance with DEFRA AURN operational guidelines. The analyser was calibrated prior to commencement of monitoring and a certified calibration span gas was employed for local site operations. However, it should be noted that there were no recorded exceedences of the 15-minute mean sulphur dioxide air quality strategy objective ( $266\mu\text{g m}^{-3}$ ) during the monitoring period and this information has been subsequently communicated to Translink, the train operator. Consequently, it will not be necessary for Belfast City Council to declare an air quality management area for sulphur dioxide in the vicinity of Ivan Street. The following graph summarises the recorded 15-minute mean values throughout the 6-month monitoring period.



### Nitrogen Dioxide.

As outlined within the context section of this progress report, Belfast City Council has already declared four air quality management areas for nitrogen dioxide associated with road transport. Predictive atmospheric dispersion modelling studies and historical monitoring data had indicated that the annual mean nitrogen dioxide national air quality strategy objective ( $40\mu\text{gm}^{-3}$ ) was likely to be exceeded along the Ormeau Road, Upper Newtownards Road, Cromac Street towards Short Strand and along the Westlink corridor during 2005. Furthermore, the hourly mean objective for nitrogen dioxide ( $200\mu\text{gm}^{-3}$  not to be exceeded more than 18 times per annum) is also expected to be exceeded along the Westlink corridor during 2005. The declared air quality management areas are a ribbon type; that is to say that they closely follow the direction of the roads on which they are based and have a small buffer zone on each side of the road to account for pollution dispersion. Currently, there are three automated analysers monitoring nitrogen dioxide within the air quality management areas, one on the Westlink and one on the Upper Newtownards Road and a further recently established automated monitoring site in the Ormeau Road air quality management area. In addition to the automated analysers, Belfast City Council also operates a number of nitrogen dioxide diffusion tubes at both background and roadside locations to provide better spatial monitoring data. The data from automated analysers can be used to assess compliance with both the 1-hour and



annual mean objectives whereas the data from diffusion tubes must be corrected and can only be used to assess compliance with the annual mean objective. The 2004 monitoring data is summarised in the following tables.

#### Automated monitors.

Monitoring Site	Site Type	Annual Mean (AQS Objective $40\mu\text{gm}^{-3}$ )	Number of exceedences of the 1 hour $200\mu\text{gm}^{-3}$ mean (18 permitted)
Lombard Street AURN Site.	Urban centre - non-kerbside site located in an area representative of exposure in town or city centre areas.	$28\mu\text{gm}^{-3}$	0
Westlink Site.	Roadside - site located between 1-5m from the kerbside of a busy road.	$46\mu\text{gm}^{-3}$	20
Upper Newtownards Road Site.	Roadside - site located between 1-5m from the kerbside of a busy road.	$42\mu\text{gm}^{-3}$	0

#### Non-Automated Diffusion Tube Monitors.

Monitoring Site	Site Type	Annual Mean (AQS Objective $40\mu\text{gm}^{-3}$ )
Royal Victoria Hospital.	Background	18
North Road.	Background	20
Blacks Road.	Kerbside	29
Cromac Street.	Kerbside	37
Short Strand.	Kerbside	28
East Bridge Street	Kerbside	34
Donegal Square South.	Kerbside	34
Milner Street.	Kerbside	32
301 Ormeau Road.	Kerbside	30
400 Ormeau Road.	Kerbside	26
Great Georges Street.	Kerbside	40
Lisburn Road.	Kerbside	25
Stockmans Lane.	Kerbside	32
Whitewell Road.	Kerbside	25

With regard to the abovementioned nitrogen dioxide diffusion tube monitoring data, as previously stated the data must be corrected before it can be adequately assessed in terms of the nitrogen dioxide annual mean objective of  $40\mu\text{gm}^{-3}$ . There are a number of approaches for correcting and ratifying diffusion tube data outlined within the DEFRA Technical Guidance document LAQM.TG(03) however, the method employed by Belfast City Council is to undertake a series of co-location studies with the automated nitrogen dioxide monitors located at the Westlink, Lombard Street and Newtownards Road sites. Therefore, a correction factor for the 2004 data has been derived as follows:

Lombard Street nitrogen dioxide annual mean	- $28\mu\text{gm}^{-3}$	
Lombard Street diffusion tube annual means	- $(25+26+32) / 3$	= $27.7\mu\text{gm}^{-3}$
Correction factor	- $(28 / 27.7)$	= 1.01
Westlink nitrogen dioxide annual mean	- $46\mu\text{gm}^{-3}$	
Westlink diffusion tube annual mean	- $(34+39+31) / 3$	= $34.7\mu\text{gm}^{-3}$
Correction factor	- $(46 / 34.7)$	= 1.33
Newtownards Road annual mean	- $42\mu\text{gm}^{-3}$	
Newtownards Rd. diffusion tube annual mean	- $(28+31+27) / 3$	= $28.7\mu\text{gm}^{-3}$
Correction factor	- $(42 / 28.67)$	= 1.46
Overall average correction factor		= 1.27

Therefore, the initial diffusion tube monitoring data should be multiplied by 1.27 to derive corrected values as follows:



Monitoring Site	Site Type	Corrected Annual Mean (AQS Objective 40 $\mu\text{gm}^{-3}$ )
Royal Victoria Hospital.	Background	23
North Road.	Background	25
Blacks Road.	Kerbside	37
Cromac Street.	Kerbside	47*
Short Strand.	Kerbside	36
East Bridge Street	Kerbside	43*
Donegal Square South.	Kerbside	43*
Milner Street.	Kerbside	41*
301 Ormeau Road.	Kerbside	38
400 Ormeau Road.	Kerbside	33
Great Georges Street.	Kerbside	51*
Lisburn Road.	Kerbside	32
Stockmans Lane.	Kerbside	41*
Whitewell Road.	Kerbside	32

\* indicates current exceedences of the nitrogen dioxide annual mean objective.

### Trends in Nitrogen Dioxide Monitoring Data.

In general, during 2004 ambient nitrogen dioxide concentrations declined as compared with 2003 levels however, this is to be expected since during 2003 warm, dry weather conditions predominated throughout the summer period giving rise to sustained levels of air pollution. The government highlighted this fact when publishing its annual Air Quality Headline Indicator for Sustainable Development, stating that in urban areas during 2004, air pollution was recorded as moderate or higher on 22 days on average per site as compared to 50 days in 2003.

Therefore, comparing 2004 data with that from 2003 indicates that nitrogen dioxide concentrations at all real time monitoring sites including Lombard Street have declined since 2003. Nonetheless, even with the recent augmentations to the M1 Motorway / Westlink corridor, the Westlink site continues to exceed both the annual and 1 hour mean objectives for nitrogen dioxide. This is to be expected since the

Westlink is one of the most highly trafficked roads within Belfast with an annual average daily traffic flow exceeding 70,000 vehicles and a heavy goods vehicle content of 12%. It should also be noted that diesel penetration within the private and light goods sector of the fleet is also significantly higher in Northern Ireland compared with the remainder of the UK at 42.2% by the end of 2003.

Similarly, the upper Newtownards Road continues to exceed the annual nitrogen dioxide mean, although the annual mean has declined from  $45\mu\text{gm}^{-3}$  in 2003 to  $42\mu\text{gm}^{-3}$  in 2004.

Reviewing the diffusion tube data indicates that background concentrations have increased in the east of the city at the North Road site whereas the Royal Victoria Site located in the West has declined from  $30\mu\text{gm}^{-3}$  in 2003 to  $23\mu\text{gm}^{-3}$  during 2004.

Both monitoring sites on the Ormeau Road have now declined below the  $40\mu\text{gm}^{-3}$  annual mean objective. However, it should be noted that both these sites are located beyond the Ormeau Bridge and greater levels of traffic congestion would be expected closer to the city centre. Therefore, Belfast City Council has recently established a real time monitoring site at residential properties adjacent to Salisbury Avenue to monitor the city centre conditions. The site will enable the impact of the nearby Gasworks redevelopment and a number of proposed residential developments along the Ormeau Road to be assessed over coming years.

The city centre-monitoring site at Cromac Street continues to exceed the annual mean objective however, this location lies in one of the already declared air quality management areas and consequently the elevated ambient nitrogen dioxide levels will be addressed through the forthcoming Belfast City Air Quality Action Plan.

The first stage of the air quality review and assessment process, completed towards the end of 2003, indicated that the nitrogen dioxide annual mean objective was expected to be exceeded at the junction of East Bridge Street, the Ravenhill Road and Short Strand. Consequently, Belfast City Council installed diffusion tube monitors at both ends of Short Strand adjacent to residential properties. The site



designated Short Strand is located the junction of Short Strand and the Sydenham flyover but 2004 monitoring data indicates that the nitrogen dioxide annual mean objective is unlikely to be exceeded at that location. However, the site designated East Bridge Street is situated adjacent to residential properties at the junction of East Bridge Street and Short Strand. Monitoring data for 2004 indicates that the annual mean nitrogen dioxide objective is currently being exceeded at this location but as previously, the elevated ambient nitrogen dioxide levels will be addressed through the forthcoming Belfast City Air Quality Action plan.

The Donegal Square South site continues to exceed the nitrogen dioxide annual mean objective however, as this site is located in a commercial area containing no residential properties, there has been no need to declare an air quality management area.

Both the Milner Street and Great Georges Street sites are located at residential properties adjacent to the Westlink corridor and both sites continue to exceed the nitrogen dioxide annual mean objective, although 2004 levels are lower than those observed in 2003. Proposals contained within the forthcoming Belfast City Air Quality Action Plan and Belfast Metropolitan Transport Plan are expected to address ambient pollution along the Westlink corridor by reducing traffic congestion through the introduction of a series of road enhancements including the replacement of two key roundabouts with over and under passes.

Blacks Road was highlighted during the 2003 monitoring programme as a result of traffic congestion associated with the construction of additional lanes on the M1 motorway, which gave rise to an exceedence of the nitrogen dioxide annual mean objective. However, the motorway enhancements were completed during 2004 and ambient nitrogen dioxide levels again have declined below the  $40 \mu\text{g m}^{-3}$  annual mean objective.

Although the revisions to the M1 Motorway were expected to significantly ease traffic flow along Stockmans Lane, it remains a major commuter route to both south Belfast and the Boucher Road retail centres. Consequently, even with the introduction of

reprofiled junction at Boucher Road, the monitoring site in Stockmans Lane continues to exceed the nitrogen dioxide annual mean objective however, Stockmans Lane lies within the M1 Motorway / Westlink corridor air quality management area and the elevated levels will be addressed through the Belfast City Air Quality Action Plan.

The Lisburn Road is another significant commuter route into Belfast City Centre, lined by numerous retail outlets, residential developments and offices. There are also a number of major schools in the vicinity of the Lisburn Road and although previous screening assessments indicated that it was not expected to exceed the nitrogen dioxide annual mean objective, it still suffers from significant morning and evening rush hour congestion. Consequently, Belfast City Council established a monitoring site on the Lisburn Road during 2004, which confirmed that measured nitrogen dioxide concentrations were significantly below the annual mean objective level.

Finally, in 2004, the Environment and Heritage Service indicated that national dispersion modelling studies had indicated there could be potential exceedences of the nitrogen dioxide annual mean objective adjacent to the M2 motorway towards Sandyknowes roundabout in the order of  $60\mu\text{g m}^{-3}$ . Belfast City Council established a monitoring site adjacent to the M2 Motorway at the Whitewell Road, which indicated that the annual mean objective is not currently exceeded at residential properties.

In conclusion, a number of major arterial routes across Belfast continue to exceed the nitrogen dioxide annual mean objective, with the Westlink corridor also exceeding the 1-hour mean objective. However, all of these locations have already been identified during the air quality review and assessment process and Belfast City Council is currently developing an action plan with a range of partner organisations including DRD Roads Service, the Planning Service and Translink, which will target these poor air quality locations. For more information on the action planning process, please refer to section 3 of this document.



**Particulate Material (PM<sub>10</sub>).**

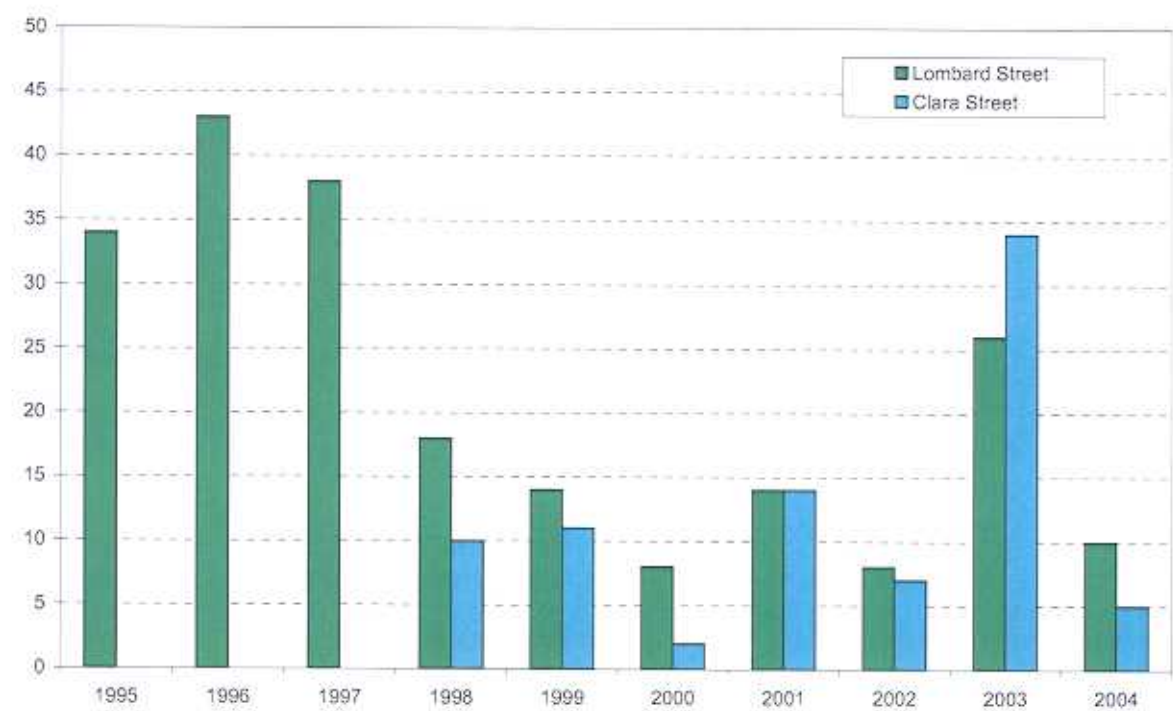
Historically, within Belfast the reliance upon solid fuel for domestic heating has led to some of the highest monitored concentrations of particulate material within the United Kingdom. Recently however, as with ambient sulphur dioxide concentrations, the introduction of natural gas both within the residential and industrial sectors has resulted in significantly reduced particulate levels across the city. Consequently, the recently completed air quality review and assessment concluded that there was little likelihood of the air quality strategy objectives (40µgm<sup>-3</sup> annual mean and 50µgm<sup>-3</sup> 24 hour mean not to be exceeded more than 35 times per annum) being exceeded within Belfast in the 2004 compliance year except in the vicinity of the Westlink corridor.

Belfast City Council currently measures particulate material at three locations across the city; Lombard Street AURN site, east Belfast Clara Street site and Westlink site. The particulate monitor employed at both the Westlink and Lombard Street sites is the Rupprecht and Patashnick Tapered Element Oscillating Microbalance (TEOM) whereas the Clara Street instrument is a Met One Instruments Beta Attenuation Monitor. Since the TEOM operates above ambient temperature, it is necessary to correct its data to make it directly comparable with the air quality strategy objectives. The monitoring site locations are summarised as follows:-

Monitoring Site	Site Type
Lombard Street AURN Site.	Urban centre - non-kerbside site located in an area representative of exposure in town or city centre areas.
Clara Street site	Suburban - sites typical of residential areas on the outskirts of a town or city.
Westlink site	Roadside - site located between 1-5m from the kerbside of a busy road.

The following graph summarises the downward trends in particulate concentrations recorded across Belfast in recent years at Lombard Street and Clara Street sites.

Exceedences of the 24 Hour Mean  $50\mu\text{gm}^{-3}$  Air Quality Strategy Objective 1995 – 2004. Maximum of 35 exceedences permitted.



Trends in Annual Means Recorded at the Lombard Street and Clara Street Sites since 1995. The air quality strategy stipulates a maximum concentration of  $40\mu\text{gm}^{-3}$ .





The Westlink was designated as an air quality management area for particulate material associated with predicted exceedences of the annual and 24-hour mean objective during 2004. Monitoring data for 2004 indicates that there were 40 exceedences of the 24-hour mean objective ( $50\mu\text{gm}^{-3}$  gravimetric not to be exceeded more than 35 times per annum) during 2004. This marks a significant decline over the 65 exceedences observed during 2003 and the 32 exceedences in 2002 (66% data capture).

The Westlink corridor has already been designated as an air quality management area and Belfast City Council is currently developing an action plan with a range of partner organisations including DRD Roads Service, the Planning Service and Translink, which will target the elevated ambient particulate levels. The proposals for the Westlink include reducing traffic congestion through the introduction of a series of road enhancements including over and under passes. For more information on the action planning process, please refer to section 3 of this document.

## Section 2 – Impending Local Developments that may have an Impact upon Ambient Air Quality.

### New Industrial Processes.

#### Part A

It should be noted that within Northern Ireland, Part A processes are administered by the Industrial Pollution and Radiochemical Inspectorate.

Application for the 2<sup>nd</sup> phase of the Department of Regional Development Water Service sewage sludge incinerator to include the construction of a new buildings, 70m stack and ancillary parking.

An initial scoping study was submitted to Belfast City Council by consultants in 2002 and a second submission was received in early 2005, however an actual formal planning application has not yet been received. Belfast City Council was asked to provide comments regarding a proposal to construct a second incinerator at the existing Duncrue Street sewage works within the Port of Belfast. Belfast City Council reviewed the submitted Environmental Impact Assessment, which included a range of dispersion modelling studies for relevant NAQS pollutants. At the time of the initial scoping submission in 2002, Belfast City Council concluded that emissions from the 2nd phase of the incinerator would not themselves generate exceedences of National Air Quality Strategy Objectives but the Council did express concerns that the sulphur dioxide emitted by the incinerator might augment existing ambient sulphur dioxide within the Port of Belfast leading to exceedences at nearby residential developments. However, since the 2002 scoping study was reviewed, the widespread uptake of natural gas throughout both the industrial and domestic sectors has resulted in significant reductions in ambient sulphur dioxide concentrations. The magnitude of these reductions supports Belfast City Council conclusion that if the incinerator were to be built today, there would now be no exceedences of any of the sulphur dioxide air quality strategy objectives within the Port of Belfast.



### **New developments that might impact upon air quality.**

It should be noted that the guidance document (LAQM.PRGNl(04)) states the local authorities should only include those developments that have been granted planning permission. Within Northern Ireland, local authorities act as statutory consultees to the Department of the Environment Planning Service however, the responsibility for granting planning permission ultimately lies with the Planning Service. Local authorities are not routinely informed whether planning permission has been granted or not once their comments have been received. Therefore, for the purposes of completing this progress report, Belfast City Council has listed those planning applications, which have the potential to have an appreciable negative impact upon air quality through the generation of additional road traffic. In all cases, Belfast City Council has employed the National Society for Clean Air Development Control Guidance: Planning for Air Quality criteria for assessing the significance of the developments, e.g.

- Proposals that will result in increased congestion, a change in either traffic volumes (for example 5% AADT or peak) or a change in vehicle speed ( $\pm 10$  kph), or both, on a road with greater than 10,000 vehicles per day.
- Proposals that would significantly alter the traffic composition in an area (e.g. bus stations, HGV parks, increased delivery traffic).
- Proposals that include new car parking (>300 spaces) or coach or lorry parks.
- Developments located in, or which may affect, sensitive areas (e.g. ecological sites) or areas of poor air quality (including AQMAs), where direct emissions to air occur, or where any of the preceding criteria are met.

Once a planning application is received and it appears that a development could have an appreciable negative impact upon localised traffic levels, Belfast City Council routinely seeks information regarding additional vehicle movements in the form of a traffic impact assessment. This information can then be used to undertake a Design Manual for Roads and Bridges (DMRB v1.02) screening assessment to predict potential exceedences of the relevant nitrogen dioxide and particulate material objectives. If the screening assessment indicates that exceedences are likely, then Belfast will subsequently request a full dispersion modelling study to

identify the extent of the exceedences and the developer will then be invited to submit mitigation measures to lessen the impact of the proposed development, ensuring that the objectives are achieved.

Where planning applications for residential developments are received in areas of existing poor air quality, Belfast City Council will request that the developer incorporate measures within the planning application to lessen the impact of the poor air quality upon the residents. Measures of this type could include redesign of the site to maximise distances from the carriageway or the introduction of forced ventilation, the inlet located in a manner to minimise the impact of the external environment upon the occupants of the buildings.

However, it should be noted that Section 106 of the Town and Country Planning Act 1990 (amended by the 1991 Act) is not applicable within Northern Ireland. Consequently Belfast City Council is presently unable to negotiate with developers in order to create acceptable developments that would otherwise be unacceptable in planning terms. If legislation comparable to Section 106 were to be made available within Northern Ireland, Belfast City Council would have the opportunity to secure obligations from developers, which might involve cash or in-kind contributions towards a range of infrastructure or services including local roads and public transport schemes, public spaces, community facilities and transport planning.

Therefore, the following planning applications have been reviewed and commented upon during 2004.

- Blackstaff Way – construction of a warehouse and industrial units to include the provision of car parking.
- Castlereagh Road – application for a residential development comprising townhouses, semi detached dwellings and duplex apartments to include parking provision.
- Chichester Street – construction of a mixed residential and retail development to include apartments, retail units, a cinema complex and associated car parking.
- Finaghy Road North – application for a housing development comprising town houses, semidetached and detached dwellings.



- Hannahstown Hill development – application for a mixed-use development comprising 700 dwellings, primary and nursery schools, commercial premises, community and leisure facilities to be constructed in a 'village' setting.
- Kennedy Way – extension to existing shopping centre to provide additional car parking spaces.
- Knock Road (dual carriageway) – application for a football stadium and associated car parking.
- Malone Road – redevelopment and extension of an existing hotel complex to include additional car parking provision.
- Ormeau Road – application for the construction of domestic dwellings and associated car parking provision on a former sports ground.
- Ormeau Road – 2<sup>nd</sup> phase of a residential development to include the construction of apartments and associated underground parking.
- Royal Avenue - application for a mixed-use development to include retail units, office accommodation, residential apartments, car parking space and service/ancillary yards.
- Short Strand – application for redevelopment of a former industrial site to provide a mixed-use development including retail units, office accommodation, residential apartments, car parking space and service/ancillary yards.
- Shore Road – application for the provision of new floodlit soccer pitches, associated changing facilities and additional car parking. Construction of town houses, apartments and retail units with associated car parking.
- Springfield Road – construction of light industrial units and associated car parking. (Part of an overall redevelopment of a former industrial site).
- Titanic Quarter – the construction of offices and associated car parking.

These developments will be considered in greater detail during the April 2006 Update and Screening Assessment.

### Section 3 - Progress with the Implementation of Air Quality Action Plans.

As already outlined, Belfast City Council declared four air quality management areas in August 2004 principally associated with road transport. Since that date, the Council has been engaged in the development of an Air Quality Action Plan, which will ultimately see the introduction of measures leading to the achievement of air quality strategy objectives for both particulate matter and nitrogen dioxide. In November 2004, the Council circulated its draft action plan and subsequently received submissions and comments from other relevant authorities by the end of January 2005.

As part of the consultation process, Belfast City Council elected to carry out a Health Impact Assessment on the action plan proposals since it was felt that this provided the best opportunity to actively engage stakeholders within the allotted 12-month action-planning window. Three stakeholder meetings were held in public venues across Belfast where members of the public and other interested parties were invited to attend and air their views on the action plan proposals. The benefit of employing a Health Impact Assessment approach is that both direct and indirect consequences of the action plan proposals can be considered by stakeholders who then have the opportunity to highlight any negative aspects of the plan or to lobby for strengthening of the existing proposals. An external consultant (Ms. Erica Ison - Public Health Resource Unit, University of Oxford) was employed by Belfast City Council to facilitate the public stakeholder meetings. Ms. Ison will also collate the views expressed during the meetings and present a formal report to Belfast City Council, which will subsequently be used to refine the air quality action plan. It is anticipated that the Health Impact Assessment process will be completed by mid September 2005.

In conjunction with the Health Impact Assessment, Belfast City Council also circulated 500 copies of the draft air quality action plan to education establishments, governmental bodies, community groups, trade bodies, health boards and elected members seeking comments. The action plan was also made available in electronic format on the Belfast City Council website where consultees were invited to submit comments online.



Belfast City Council also highlighted the development of the air quality action in its City Matters magazine. The magazine was circulated to all 120,000 households in Belfast at the beginning of August 2005 and residents were invited to express their views on the seven key action plan policy areas.

With regard to the action plan content, it is anticipated that the most significant components will comprise those actions submitted by the Department for Regional Development Roads Service, which are derived from the Belfast Metropolitan Transport Plan (BMTP). In totality, the BMTP measures are reported to reduce ambient NO<sub>x</sub> emissions across Belfast by 52% in the year 2015 and to deliver sufficient reductions by 2010 to enable Belfast to comply with the relevant European Community nitrogen dioxide limit values.

Therefore, it is anticipated that consultation on the air quality action plan will be completed by October 2005. There will then be a period of weeks to allow the action plan to be refined and it will then be submitted to the Department of the Environment in Northern Ireland for formal appraisal.

Consequently, until the air quality action plan has been formally accepted by the Department, few actions can be formally instigated and therefore, it is inappropriate to provide an implementation timetable at this time. However, it should be noted that the Belfast Metropolitan Transport Plan was formally launched by the Minister for Regional Development on 30<sup>th</sup> November 2004 and builds upon the Regional Development Strategy and the Regional Transportation Strategy, both of which have already been accepted by the Northern Ireland Assembly. As such, an implementation timetable has already been developed for the Belfast Metropolitan Transport Plan and consequently improvements to the strategic road network in the form of road improvements, active traffic management and driver information are or have already been implemented, including the significant upgrade of the M1 motorway and the introduction of numerous quality bus corridors throughout Belfast.

Therefore, although the air quality action plan has not been formally implemented at this juncture, measures have already being implemented which are currently contributing towards significant improvements in ambient air quality.

## Conclusion.

The Draft Progress Report Guidance document LAQM.PRGN19(04) states that the principal objective of a progress report is to highlight a local authority's progress towards implementing effective air quality management and reducing ambient air pollution levels. Therefore, this report initially reviewed ambient monitoring data and concluded that ambient sulphur dioxide, ozone and carbon monoxide concentrations do not currently give cause for concern across Belfast. However, ambient monitoring data for nitrogen dioxide and particulate material continues to highlight the issue of transport related pollution and the need to lessen the public's reliance on the private motorcar for transport.

Therefore, in recognising this problem, Belfast City Council declared four air quality management areas associated with road transport in August 2004 and has since been developing an action plan to address the problem with strategic partners including the Planning Service, the Roads Service and Translink. As reported in section 3 of this report, Belfast City Council has also been engaged in widespread consultation regarding the action plan to assess public support for the proposed measures. Once all comments have been reviewed, the action plan will be refined before being submitted to the Department of the Environment for formal appraisal. It is anticipated that the Belfast City Air Quality Action plan will be formally launched in early 2006 and Belfast City Council will then oversee and periodically report upon the plan's implementation.

In the mean time, Belfast City Council will also continue to keep a watching brief on developments across the city. As a statutory consultee to the Planning Service, Belfast City Council will endeavour to ensure that air quality is considered within the planning process wherever appropriate. It is hoped that such an approach will ensure that new developments are not allowed to worsen air quality and that residential developments are not permitted to be built in locations where air quality is already poor.