Down District Council

# Air Quality Progress Report 2010 for Down District Council

**In fulfillment of the Environment (Northern Ireland) Order 2002 - Local Air Quality Management**

**28th May 2010**

www.downdc.gov.uk

INVESTORS IN PEOPLE

| | |
|---|---|
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|---|---|
| **Report Reference number** | |
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# Executive Summary

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 68,000. The main centres of population are located in Downpatrick, Newcastle and Ballynahinch. Agriculture and tourism form by far the most significant economic base in the area, with relatively little heavy industry.

With respect to Nitrogen Dioxide, the 2010 Progress Report has identified three exceedences of the Nitrogen Dioxide annual mean objective at diffusion tube monitoring sites in Downpatrick i.e. Irish Street, Market Street and Church Street. A Detailed Assessment for $NO_2$ was submitted by Down District Council in 2010. A real time analsyer is currently being located at the Irish Street/Market Street junction, Downpatrick and monitoring will occur for a six month period. If after this time results indicate continued exceedences of the annual mean objectives then an Air Quality Management Area will be declared. Action has already been taken to delineate the extent of this AQMA if required.

There have been no other exceedences of the Air Quality Strategy objectives within Down District Council area.

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# 1 Introduction

## 1.1 Description of Local Authority Area

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 68,000 (table 1.1).


Figure 1- map of Down District Council

Table 1.1 Population projections for Down District Council 2009- 2012 (**www.nisra.gov.uk**, accessed 23rd September 2009)

| | | | | |
|---|---|---|---|---|
| | 2009 | 2010 | 2011 | 2012 |
| **Pop** | 68,189 | 68,692 | 69,189 | 69,701 |

The table shows sustained population growth for Down District Council area. The main centres of population are located in Downpatrick, Newcastle and Ballynahinch. Agriculture and tourism form by far the most significant economic base in the area, with relatively little heavy industry. The Irish Sea and the inlet to Strangford Lough form a natural boundary for the south and east of the District. Much of this boundary has Area of Special Scientific Interest (ASSI) status. To the south of the District are the Mourne Mountains which may form the centre of Northern Ireland's first National Park. The Ards and Down Area Plan prepared under Part III of the Planning (Northern Ireland) Order 1991 will have future impacts on air quality within Down District Council. The Council has five neighbouring council areas: Ards Borough Council; Castlereagh Borough Council; Lisburn Borough Council; Banbridge District Council and Newry and Mourne District Council. The Review of Public Administration recommended that Down District Council and Newry and Mourne District Council will become one of the new "super" Councils.

## 1.2 Purpose of Progress Report

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

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

## 1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in Northern Ireland are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.2. This table shows the objectives in units of microgrammes per cubic metre μg/m$^3$ (milligrammes per cubic metre, mg/m$^3$ for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable). **Table 1.2** Air Quality Objectives included in Regulations for LAQM in Northern Ireland.

| Pollutant | Concentration | Measured as | Date to be achieved by |
|---|---|---|---|
| **Benzene** | 16.25 μg/m$^3$ | Running annual mean | 31.12.2003 |
| | 3.25 μg/m$^3$ | Running annual mean | 31.12.2010 |
| **1,3-Butadiene** | 2.25 μg/m$^3$ | Running annual mean | 31.12.2003 |
| **Carbon monoxide** | 10.0 mg/m$^3$ | Running 8-hour mean | 31.12.2003 |
| **Lead** | 0.5 μg/m$^3$ | Annual mean | 31.12.2004 |
| | 0.25 μg/m$^3$ | Annual mean | 31.12.2008 |
| **Nitrogen dioxide** | 200 μg/m$^3$ not to be exceeded more than 18 times a year | 1-hour mean | 31.12.2005 |
| | 40 μg/m$^3$ | Annual mean | 31.12.2005 |
| **Particles ($PM_{10}$) (gravimetric)** | 50 μg/m$^3$, not to be exceeded more than 35 times a year | 24-hour mean | 31.12.2004 |
| | 40 μg/m$^3$ | Annual mean | 31.12.2004 |
| **Sulphur dioxide** | 350 μg/m$^3$, not to be exceeded more than 24 times a year | 1-hour mean | 31.12.2004 |
| | 125 μg/m$^3$, not to be exceeded more than 3 times a year | 24-hour mean | 31.12.2004 |
| | 266 μg/m$^3$, not to be exceeded more than 35 times a year | 15-minute mean | 31.12.2005 |

## 1.4 Summary of Previous Review and Assessments

Down District Council has completed the following reviews and assessments of air quality in earlier rounds of the assessment process:

**Table 1.3- Summary of previous reviews**

| | |
|---|---|
| **Stage 1 Report (DDC, 2000)** | The first stage assessment identified all significant pollutant sources with Down District Council area. The air quality objectives were unlikely to be exceeded and no detailed assessment was necessary. |
| **Stage 2/3 Air quality review (DDC, 2003)** | The conclusions of this review stated that there was no need to progress to the third stage review and assessment and that no Air Quality Management Areas (AQMA'S) needed to be declared. |
| **Progress report (DDC, 2005)** | The progress report concluded that $NO_2$, $SO_2$ and $PM_{10}$ were not predicted to cause exceedences of the air quality objectives at relevant receptors. |
| **Updating and Screening Assessment (DDC, 2006)** | The USA was carried out according to Local Air Quality Management Policy Guidance LAQM.TG(03). The assessment looked at seven pollutants and no detailed assessments were required. No AQMA's were required in Down District Council and there was no need for a detailed assessment in 2007. |
| **Progress Report (EG, 2008)** | Diffusion tube monitoring indicated that the annual average objective for $NO_2$ was being exceeded at the Irish Street location in Downpatrick. Down DC Officers evaluated sites with a view to installing real time monitoring equipment. There are currently no Air Quality Management Areas (AQMA'S) within the Down District Council area.<br>Diffusion tube measurements made in the Irish Street area during 2007 and 2008 indicated exceedences in relation to |

| | |
|---|---|
| | $NO_2$. A detailed assessment involving additional diffusion tubes was commenced in late 2008 at this Irish Street location. |
| **Updating and Screening Assessment (DDC, 2009)** | The main conclusion from the 2009 Updating and Screening Assessment (USA) was that diffusion tube measurements at Irish Street junction, Downpatrick indicated exceedences of the annual mean objective for nitrogen dioxide in both 2007 and 2008. There is relevant exposure at this location. The measurement of nitrogen dioxide at the remaining monitoring sites has shown no exceedences of air quality objectives. Down District Council then undertook a Detailed Assessment for $NO_2$ in the vicinity of Irish Street. |
| **Detailed Assessment 2010** | For the purposes of this Detailed Assessment additional $NO_2$ diffusion tubes were placed along Market Street, Irish Street, English Street and Church Street, Downpatrick. These additional tubes were installed in October 2008 and a full year of monitoring has now occurred. Following a bias adjustment of the diffusion tube results it was found that the tubes at Down 1(Irish Street location) Down 11 (Church Street) and Down 13 (Market Street) exceeded the air quality limit of 40ug/$m^3$ for Nitrogen Dioxide.<br>Down District Council have committed to installing a real time analyser on Market Street junction, Downpatrick, as local authorities are advised not to rely upon diffusion tube data alone to declare an Air Quality Management Area (A1.42 LAQM Technical Guidance LAQM .TG(09)). It is expected that this equipment will be operational at the beginning of June 2010 and the results obtained over the following six month period will influence Down District Council in declaring an Air Quality Management Area (AQMA). Down District Council are still awaiting acceptance of this Detailed Assessment by DOE. |

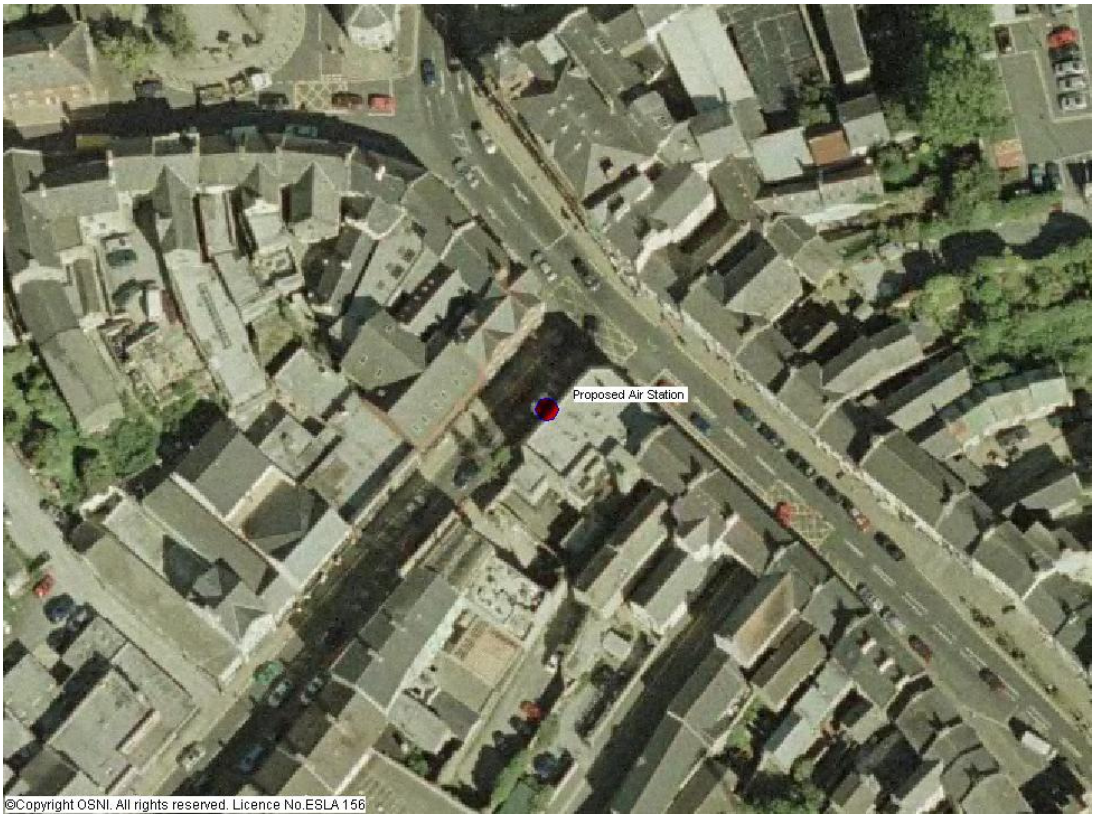
# 2 New Monitoring Data

## 2.1 Summary of Monitoring Undertaken

### 2.1.1 Automatic Monitoring Sites

There are currently no automatic monitoring sites within the Down District Council area. It is anticipated that a real time analyser will be operational on Market Street, Downpatrick during June 2010.

**Figure 2.1 Map of Proposed Automatic Monitoring Site**

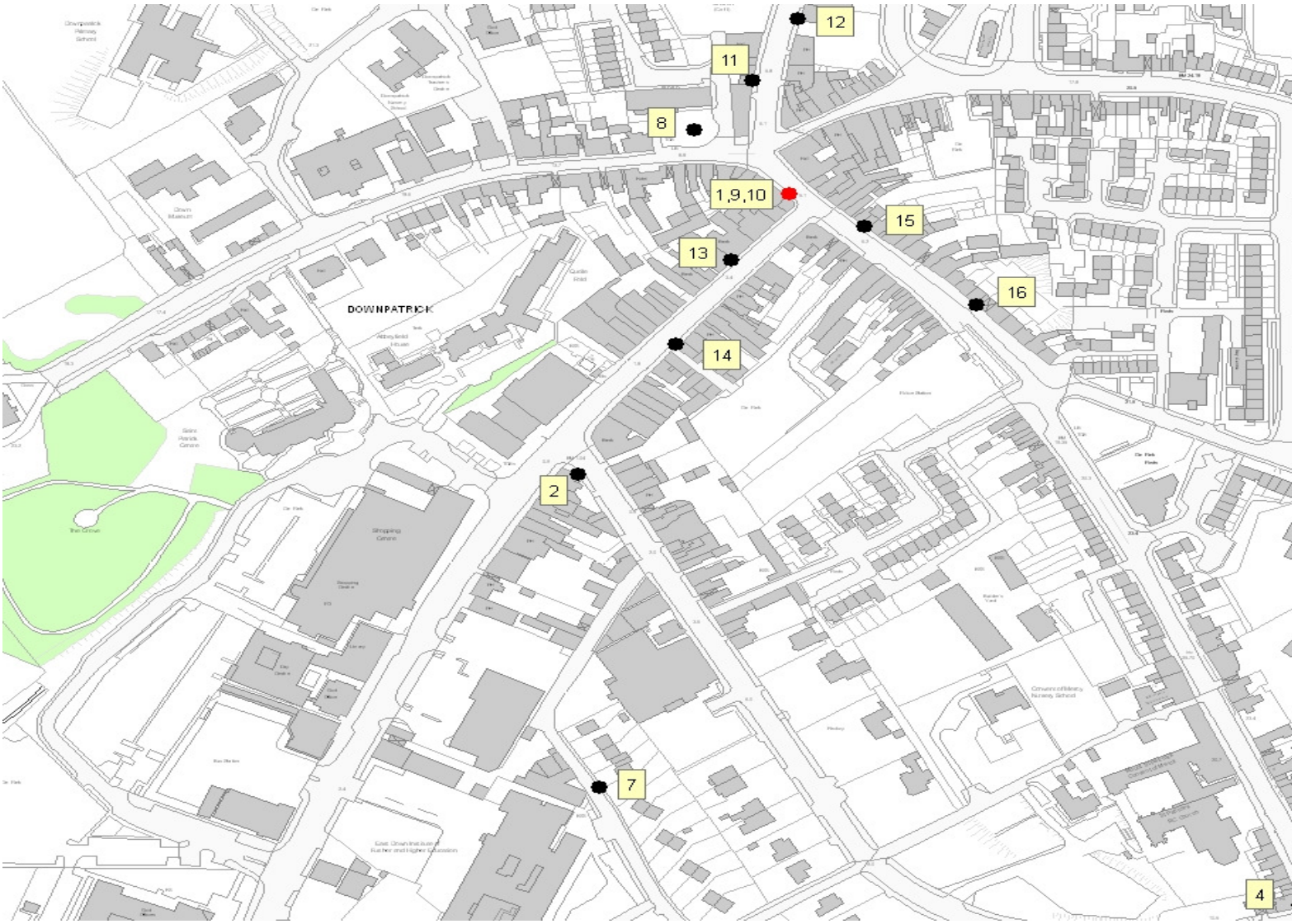


### 2.1.2 Non-Automatic Monitoring

Down District Council carries out monitoring of $NO_2$ by using diffusion tubes at fourteen sites (one of which is a triplicate). Diffusion tube data cannot be compared directly with air quality limit values based on short-term averages; however, they can be used to help identify areas with high concentrations of $NO_2$, which require more detailed investigation. The aim of the $NO_2$ monitoring undertaken has been to measure pollutant concentrations at busy roads and junctions especially near residential areas. The tubes are sited using guidelines from NETCEN but are not part of the monitoring network. Up to November 2004, the $NO_2$ diffusion tubes were supplied and analysed by Ruddock and Sheratt. Since then, Casella has supplied and analysed the tubes. The tubes are currently prepared using 10% TEA in water. Triplicate diffusion tubes are now located at the Irish Street junction in Downpatrick. Additional diffusion tubes were also located at a variety of locations close to the Irish Street junction from October 2008.

The diffusion tube studies for Down District Council for the last five years shows an increasing level at the Irish Street site (see figure 2.5). Further information on the diffusion tube measurements and the QA/QC arrangements are given in Appendix A. None of the sites were co-located with an automatic $NO_2$ analyser. Details of the sites are given in figure 2.2 and table 2.2.

**Figure 2.2 Maps of Non-Automatic Monitoring Sites within Downpatrick**

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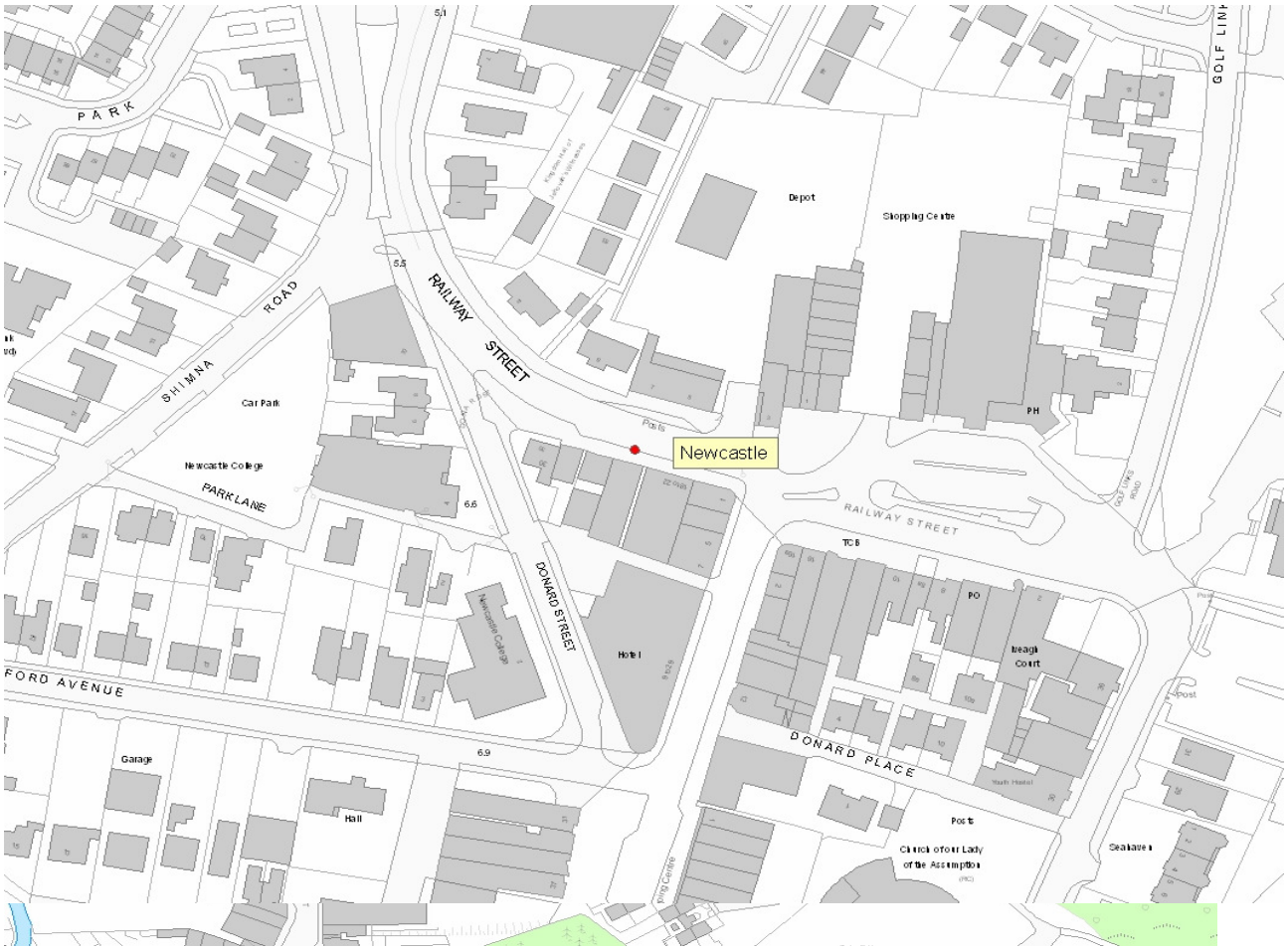
Site for Irish Street triplicate tubes 2 M high beside window of 1st floor apartment at 5 Irish Street

Sites approximately 50M and 100M from existing site ( all single tubes )

**Figure 2.3 Ballynahinch $NO_2$ site (Down 6) -**

**Figure 2.4 Newcastle diffusion tube location-** ●



## Table 2.2 Details of Non- Automatic Monitoring Sites

| **Site Name** | **Site Type** | **Easting** | **Nothings** | **Pollutant** Monitored | **In AQMA ?** | **Relevant Exposure?** *(Y/N with distance (m) to relevant exposure)* | **Distance to kerb of nearest road** *(N/A if not applicable)* | **Worst-case Location?** |
|---|---|---|---|---|---|---|---|---|
| DOWN1-Irish Street- Triplicate | Roadside | 348702 | 344448 | $NO_2$ | N | Y | 1 | Y |
| DOWN2-St Patrick's Ave | Kerbside | 348542 | 344448 | $NO_2$ | N | N | 1 | N/A |
| DOWN3- Orchard Way | B'ground | 348893 | 345903 | $NO_2$ | N | Y | 1 | N/A |
| DOWN4- Stream Street | Kerbside | 348915 | 344207 | $NO_2$ | N | N | 1 | N/A |
| DOWN5- Newcastle | Roadside | 337818 | 331601 | $NO_2$ | N | Y | 0.5 | Y |
| DOWN6- Ballynahinch | Roadside | 336592 | 352216 | $NO_2$ | N | Y | 2 | Y |
| DOWN7-St Patrick's Drive | B'ground | 348605 | 344205 | $NO_2$ | N | Y | 1 | N/A |
| DOWN8-English Street | Roadside | 348605 | 344664 | $NO_2$ | N | Y | 6 | N |
| DOWN9- Irish Street triplicate | Roadside | 348702 | 344448 | $NO_2$ | N | Y | 1 | Y |
| DOWN10- Irish Street Triplicate | Roadside | 348702 | 344448 | $NO_2$ | N | Y | 1 | Y |
| DOWN11- Church St (50m) | Roadside | 348422 | 344646 | $NO_2$ | N | Y | 1 | Y |
| DOWN12- Church St (100m) | Roadside | 348664 | 344744 | $NO_2$ | N | Y | 1 | Y |
| DOWN13- Market Street (50m) | Roadside | 348686 | 344509 | $NO_2$ | N | Y | 1 | Y |
| DOWN14- Market St (100m) | Roadside | 348598 | 344531 | $NO_2$ | N | Y | 1 | Y |
| DOWN15-Irish St (50m) | Roadside | 348702 | 344609 | $NO_2$ | N | Y | 1 | Y |
| DOWN16- Irish St (100m) | Roadside | 348735 | 344566 | $NO_2$ | N | Y | 1 | Y |

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

In the following sections, statistics are presented for Nitrogen Dioxide ($NO_2$), derived from the diffusion tube measurements. These statistics are compared with the objectives for the different pollutant (see table 1-2) to identify exceedences. Down District Council does not carry out any monitoring for other pollutants.

### 2.2.1 Nitrogen Dioxide

In the following section monitoring results are presented for all diffusion tube sites and comparison made with the objective.

**Diffusion Tube Monitoring Data**

Down District Council currently have 14 monitoring locations for $NO_2$, and one location uses triplicate tubes. Detailed $NO_2$ monitoring commenced in October 2008 in the vicinity of Irish Street, Downpatrick. There are sensitive receptors at the Irish Street location. A bias adjustment factor of 0.81 was used for the results obtained in 2009. This was taken as the weighted average of 9 studies in the bias-adjustment spreadsheet available from the LAQM page of the National Air Quality website (http://www.airquality.co.uk/archive/laqm/tools.php).

There was less than 90% data capture at Down 4, Down 6 and Down 16 during 2009. Down 6 and Down 16 are located close to relevant exposure, while Down 4 has no relevant exposure. The diffusion tubes were destroyed or stolen on 3 or more occasions during 2009. By using the guidance found in Box 3.2 of TG (09) to estimate the annual mean concentration no breach of the air objective for $NO_2$ was found. Down 4 was 47.75 (no relevant exposure), Down 6 was 32.67 and Down 16 was 39.88 $\mu g/m^3$.

The $NO_2$ diffusion tube data are summarised in the table 2.4. The full dataset (monthly mean values) are included in Appendix B.

The 2009 diffusion tube results show three sites within Downpatrick town centre where exceedences of the annual mean $NO_2$ objective are occurring:

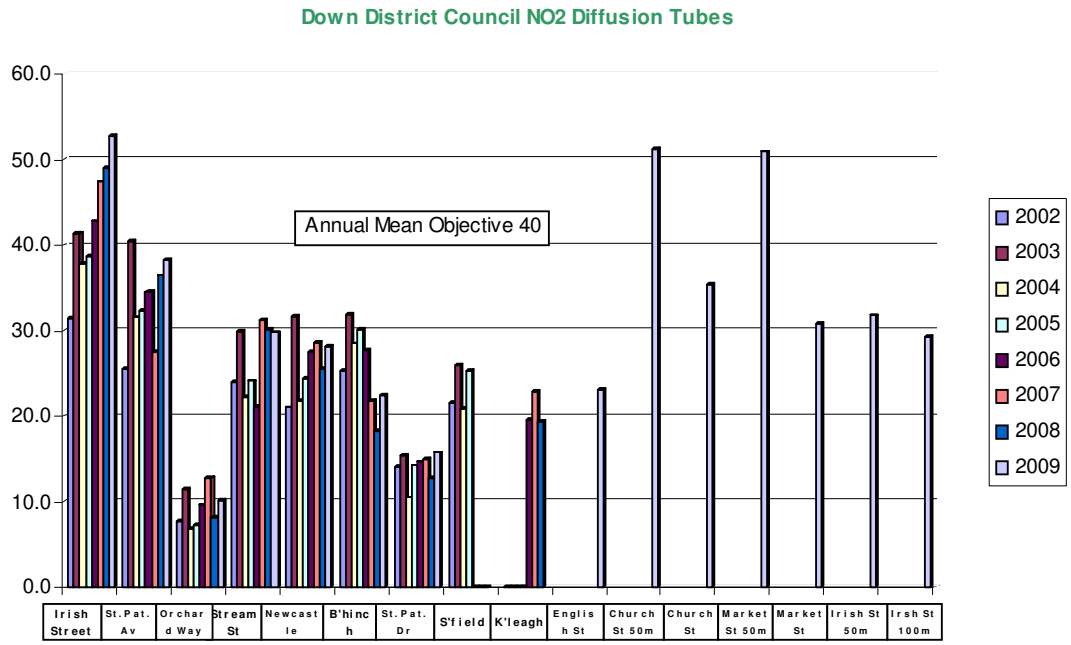
- Site Down 1 – Irish Street (triplicate site)
- Site Down 11- Church Street 50m from Down1
- Site Down 13- Market Street 50m from Down1

**Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes**

| Site ID | Location | Within AQMA? | Data Capture for monitoring period % | Data Capture for full calendar year 2009 % | Annual mean concentrations (µg/m$^3$) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 2007 | 2008 | 2009 |
| Down 1 | Irish Street (average) | N | 100 | 100 | 47.4 | 49.1 | **52.7** |
| Down 2 | St. Patrick's Avenue | N | 100 | 100 | 27.5 | 36.4 | 38.2 |
| Down 3 | Orchard Way | N | 100 | 100 | 12.7 | 8.1 | 10.2 |
| Down 4 | Stream Street | N | 33 | 33 | 31.3 | 30.1 | 47.8 d |
| Down 5 | Newcastle | N | 100 | 100 | 28.7 | 25.5 | 28.2 |
| Down 6 | Ballynahinch | N | 75 | 75 | 21.8 | 18.2 | 32.7 d |
| Down 7 | St, Patrick's Drive | N | 100 | 100 | 14.9 | 12.7 | 15.7 |
| Down 8 | Killyleagh (b) | | N/A | N/A | 22.8 | 19.4 | N/A |
| Down 8 | English Street © | N | 100 | 100 | N/A | 23.0 | 23.2 |
| Down11 | Church Street 50m | N | 92 | 92 | N/A | 19.4 | **51.2** |
| Down12 | Church Street 100m | N | 100 | 100 | N/A | 23.0 | 35.4 |
| Down13 | Market Street 50m | N | 100 | 100 | N/A | 58.4 | **50.9** |
| Down14 | Market Street 100m | N | 100 | 100 | N/A | 29.1 | 30.8 |
| Down15 | Irish Street 50m | N | 92 | 92 | N/A | 36.0 | 31.7 |
| Down16 | Irish Street 100m | N | 58 | 58 | N/A | 32.4 | 39.9 d |

b- removed in October 2008
c- installed in October 2008
d- estimated using TG(09)

**Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites.**



### 2.2.2 $PM_{10}$

Down District Council does not carry out monitoring for $PM_{10}$ pollution at this time.

### 2.2.3 Sulphur Dioxide

Down District Council ceased monitoring for Sulphur Dioxide in Ballynahinch during 2006. There were no exceedences of the air quality objectives for $SO_2$ at this site.

### 2.2.4 Benzene

Down District Council does not carry out monitoring for Benzene at this time.

### 2.2.5 Other pollutants monitored

N/A

### 2.2.5 Summary of Compliance with AQS Objectives

Down District Council have measured concentrations of Nitrogen Dioxide above the annual mean objective at relevant locations during 2009. Down District Council has submitted a Detailed Assessment in 2010 for the area centred on Irish Street, Downpatrick. Down District Council is installing a real time analyser in June 2010 at this location and if monitoring shows continued exceedences of the objective an AQMA will be declared.

# 3 New Local Developments

## 3.1 Road Traffic Sources

Down District Council confirms that there are no new or newly identified road traffic sources which may affect air quality within its local authority area.

## 3.2 Other Transport Sources

Down District Council confirms that there are no new or newly identified other transport sources which may affect air quality within its local authority area.

## 3.3 Industrial Sources

Down District Council confirms that there are no new or newly identified industrial sources which may affect air quality within its local authority area.

## 3.4 Commercial and Domestic Sources

Down District Council confirms that there are no new or newly identified commercial and domestic sources which may affect air quality within its local authority area.

## 3.5 New Developments with Fugitive or Uncontrolled Sources

There are no new landfill sites, quarries, unmade roads, waste transfer stations or other potential sources of fugitive particulate emissions within Down District Council area.

Down District Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

# 4 Planning Applications

There are no approved Planning applications which could impact upon air quality within Down District Council area.

# 5 Conclusions and Proposed Actions

## 5.1 Conclusions from New Monitoring Data

The results for $NO_2$ show breaches of the objective of 40ug/$m^3$ at Down1 (triplicate site-Irish Street), Down 11 (Church Street) and Down 13(Market Street) all in the vicinity of the Irish Street and Market Street junction Downpatrick. This area is a compact area running 50 metres from the triplicate site along Market Street and Church Street. There is no relevant exposure at the Church Street location. There are residential properties at elevated heights ranging from 2 –4 metres from road level at both the Market street and Irish Street locations. There are no breaches of the objective limit at the other sites within Downpatrick. The wide variation with the monthly results introduces a degree of uncertainty over a decision to declare an AQMA at this time. Additional monitoring will occur when the real time analyser is operational on Market Street and this will influence the need for an AQMA.

## 5.2 Conclusions relating to New Local Developments

N/A

## 5.3 Proposed Actions

The estimated annual mean for sites Down 1, Down 11 and Down13 are above the objective limit of 40 ug/$m^3$ and Down District Council are currently installing a real time analyser at Market Street, Downpatrick. The declaration of an AQMA at this location if necessary will occur once six months of real time results are obtained.

# 6 References

Diffusion Tubes for Ambient NO2 Monitoring: **Practical Guidance for Laboratories and Users** – AEA

DDC (2009) **Air Quality Update and Screening and Assessment**. DDC, October 2009.

DDC (2009) **Air Quality Update and Screening and Assessment**. DDC, October 2009.

DDC (2010) **Detailed Assessment for $NO_2$ at Market Street/Irish Street junction, Downpatrick**

Defra (2007). **The Air Quality Strategy for England, Scotland, Wales and Northern Ireland**. http://www.defra.gov.uk/environment/airquality/strategy/ (Accessed April 2010)

EG (2008) **Eastern Group Air Quality Progress Report**. Annual report on air quality in the Eastern group of local authorities in Northern Ireland, April 2008.

TG (2009) **Part IV of the Environment Act 1995. Local Air Quality Management: Technical Guidance LAQM.TG (09)**. Guidance prepared by the Department for Environment, Food and Rural Affairs and the Devolved Administrations, February 2009.

# Appendices

Appendix A: QA/QC Data

Appendix B: $NO_2$ results for 2009

# Appendix A: QA:QC Data

### Diffusion Tube Bias Adjustment Factors

Up to November 2004, the $NO_2$ diffusion tubes were supplied and analysed by Ruddock and Sheratt. Since then, Casella has supplied and analysed the tubes. The tubes are currently prepared using 10% TEA in water. Casella participate in the Work Place Analysis Scheme for Proficiency (WASP) for $NO_2$. Down District Council obtained the appropriate bias factor from the UWE Review and Assessment Website. A factor of 0.81 was taken from the drop down menus available on the excel spreadsheet matrix.
Information regarding Casella's Bias Adjustment can be viewed at:
www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube310310.xls

Information regarding the tube precision can be viewed at:
http://www.uwe.ac.uk/aqm/review/R&Asupport/Tube_Precision2009(Mar2010).pdf

### Factor from Local Co-location Studies (if available)

Down District Council did not use a Bias Factor from a local Co-location study. Down DC does not have an automatic $NO_2$ analyser in the district to carry out a co-location assessment.

### Discussion of Choice of Factor to Use

Down District Council used the Bias Factor from the UWE Air Quality Website. This was calculated by using the matrix available on the site by selecting the appropriate laboratory, year of monitoring and significant methodology.

### PM Monitoring Adjustment

Not applicable.

### Short-term to Long-term Data adjustment

Not applicable.

### QA/QC of automatic monitoring

Not applicable.

## Appendix B- $NO_2$ results for 2009

### LAB RESULTS FOR $NO_2$- BIAS NOT APPLIED

| | 2009 | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| Down 1 | Irish Street | 81 | 73 | 70 | 63 | 60 | 53 | 53 | 59 | 92 | 55 | 77 | 61 |
| Down 1 | Irish Street average | 82 | 77 | 65 | 65 | 61 | 57 | 51 | 63 | 71 | 39 | 87 | 64 |
| Down 2 | St. Patrick's Avenue | 53 | 61 | 15 | 57 | 49 | 44 | 46 | 34 | 67 | 37 | 52 | 51 |
| Down 3 | Orchard Way | 19 | 18 | 13 | 8 | 7 | 9 | 5 | 10 | 15 | 19 | 11 | 17 |
| Down 4 | Stream Street | - | 66 | - | - | 31 | - | 34 | - | - | 16 | - | - |
| Down 5 | Newcastle | 22 | 37 | 32 | 44 | 34 | 33 | 36 | 35 | 46 | 42 | 26 | 31 |
| Down 6 | Ballynahinch | 23 | 36 | 26 | 16 | 13 | - | - | - | 36 | 41 | 20 | 38 |
| Down 7 | St, Patrick's Drive | 14 | 27 | 20 | 13 | 10 | 11 | 12 | 21 | 27 | 31 | 23 | 24 |
| Down 9 | Irish Street | 82 | 77 | 65 | 66 | 60 | 58 | 46 | 70 | 24 | 31 | 113 | 66 |
| Down 10 | Irish Street | - | 80 | 60 | 66 | 62 | 61 | 55 | 59 | 96 | 31 | 71 | 64 |
| Down 8 | English Street | 30 | 35 | 29 | 29 | 27 | 23 | 23 | 25 | 36 | 31 | 23 | 32 |
| Down 11 | Church Street 50m | - | 93 | 68 | 54 | 48 | 53 | 49 | 50 | 99 | 48 | 66 | 67 |
| Down 12 | Church Street 100m | 39 | 53 | 39 | 46 | 42 | 45 | 35 | 33 | 58 | 47 | 39 | 48 |
| Down 13 | Market Street 50m | 48 | 97 | 59 | 55 | 54 | 68 | 46 | 30 | 116 | 46 | 61 | 74 |
| Down 14 | Market Street 100m | 31 | 46 | 35 | 38 | 32 | 33 | 28 | 51 | 58 | 30 | 34 | 40 |
| Down 15 | Irish Street 50m | 35 | 54 | 36 | 34 | 34 | 40 | | 22 | 64 | 33 | 35 | 44 |
| Down 16 | Irish Street 100m | 28 | 51 | 37 | 33 | - | - | - | - | - | 29 | 32 | 43 |

- tube missing

### Lab Results for $NO_2$ – 2009 Bias applied

| | 2009 | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Bias 0.81 applied** | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Down 1 | Irish Street | 66.0 | 62.1 | 52.7 | 52.7 | 49.1 | 46.4 | 41.6 | 50.8 | 57.2 | 31.6 | 70.5 | 51.6 |
| Down 2 | St. Patrick's Avenue | 42.9 | 49.4 | 12.2 | 46.2 | 39.7 | 35.6 | 37.3 | 27.5 | 54.3 | 30.0 | 42.1 | 41.3 |
| Down 3 | Orchard Way | 15.4 | 14.6 | 10.5 | 6.5 | 5.7 | 7.3 | 4.1 | 8.1 | 12.2 | 15.4 | 8.9 | 13.8 |
| Down 4 | Stream Street | - | 53.5 | - | - | 25.1 | - | 27.5 | - | - | 13.0 | - | - |
| Down 5 | Newcastle | 17.8 | 30.0 | 25.9 | 35.6 | 27.5 | 26.7 | 29.2 | 28.4 | 37.3 | 34.0 | 21.1 | 25.1 |
| Down 6 | Ballynahinch | 18.6 | 29.2 | 21.1 | 13.0 | 10.5 | - | - | - | 29.2 | 33.2 | 16.2 | 30.8 |
| Down 7 | St, Patrick's Drive | 11.3 | 21.9 | 16.2 | 10.5 | 8.1 | 8.9 | 9.7 | 17.0 | 21.9 | 25.1 | 18.6 | 19.4 |
| Down 8 | English Street | 24.3 | 28.4 | 23.5 | 23.5 | 21.9 | 18.6 | 18.6 | 20.3 | 29.2 | 25.1 | 18.6 | 25.9 |
| Down 11 | Church Street 50m | - | 75.3 | 55.1 | 43.7 | 38.9 | 42.9 | 39.7 | 40.5 | 80.2 | 38.9 | 53.5 | 54.3 |
| Down 12 | Church Street 100m | 31.6 | 42.9 | 31.6 | 37.3 | 34.0 | 36.5 | 28.4 | 26.7 | 47.0 | 38.1 | 31.6 | 38.9 |
| Down 13 | Market Street 50m | 38.9 | 78.6 | 47.8 | 44.6 | 43.7 | 55.1 | 37.3 | 24.3 | 94.0 | 37.3 | 49.4 | 59.9 |
| Down 14 | Market Street 100m | 25.1 | 37.3 | 28.4 | 30.8 | 25.9 | 26.7 | 22.7 | 41.3 | 47.0 | 24.3 | 27.5 | 32.4 |
| Down 15 | Irish Street 50m | 28.4 | 43.7 | 29.2 | 27.5 | 27.5 | 32.4 | - | 17.8 | 51.8 | 26.7 | 28.4 | 35.6 |
| Down 16 | Irish Street 100m | 22.7 | 41.3 | 30.0 | 26.7 | - | - | - | - | - | 23.5 | 25.9 | 34.8 |