BALLYMONEY
BOROUGH COUNCIL

# AIR QUALITY

# PROGRESS REPORT

# BALLYMONEY BOROUGH COUNCIL

## June 2010

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## EXECUTIVE SUMMARY

The Environment (Northern Ireland) Order 2002 and subsequent Regulations introduced the Local Air Quality Management (LAQM) system which requires District Councils to undertake regular review and assessment of air quality, with respect to the standards and objectives set in the Air Quality Strategy. In areas where an air quality objective is predicted not to be met by the required date, District Councils are required to establish Air Quality Management Areas (AQMA's) and implement Action Plans to improve air quality. This document forms the Progress Report for Ballymoney Borough Council. In writing this report the Council has had regard to the Government's published guidance confirmed in Progress Report Guidance LAQM.PRGNI (04).

This report provides the latest $PM_{10}$ monitoring results from the station located in the Glebeside estate and recommends that the local air quality management area be revoked. The Nitrogen Dioxide diffusion tube monitoring carried out across the Borough indicates that the Air Quality Objectives for this pollutant continue to be met and that exceedances are not anticipated, however, Ballymoney Borough Council will continue to monitor through the use of diffusion tubes.

## INTRODUCTION

The Environment (Northern Ireland) Order 2002 and subsequent Regulations introduced the Local Air Quality Management (LAQM) system which requires District Councils to undertake regular review and assessment of air quality, with respect to the standards and objectives set in the Air Quality Strategy. In areas where an air quality objective is predicted not to be met by the required date, District Councils are required to establish Air Quality Management Areas (AQMA's) and implement Action Plans to improve air quality.

## 1.1 PURPOSE & ROLE OF PROGRESS REPORTS

The Progress report is intended to ensure continuity in the LAQM process. Its objective is to provide an annual review and update on Air Quality issues, including developments that might be significant to Air Quality. Any significant developments can then be acted on immediately, rather than waiting for the next full round of review and assessment. The benefits to District Councils are set out in Box 1.1 of the Progress Report Guidance LAQM.PRGNI(04), but these included the following: -

- To provide a readily accessible source of up to date information in Air Quality, which may be useful to District Council staff for dealing with enquiries from members of the public, developers carrying out environmental assessments and to assist in other areas such as transport and land use planning.
- To ensure continuity in maintaining resourcing, capability and staff skills for LAQM within the District Council.
- To help get maximum value from the monitoring carried out be the District Council.

This document forms the Progress Report for Ballymoney Borough Council. In writing this report the Council has had regard to the Government's published guidance confirmed in Progress Report Guidance LAQM.PRGNI(04).

## 1.2 AIR QUALITY STRATEGY OBJECTIVES

The Air Quality Strategy's standards and objectives are shown in Table 1. The table shows the standards in ugm$^{-3}$ (mgm$^{-3}$ for CO) with the number of exceedances that are permitted (where applicable).

**Table 1 Objectives included in the Air Quality Regulations (NI) 2003**

| Pollutant | Air Quality Objective | | Date to be achieved by |
|---|---|---|---|
| | Concentration | Measured as | |
| Benzene<br>All authorities | 16.25 $\mu$g m$^{-3}$ | running annual mean | 31.12.2003 |
| Authorities in England and Wales only | 5.00 $\mu$g m$^{-3}$ | annual mean | 31.12.2010 |
| Authorities in Scotland and Northern Ireland only | 3.25 $\mu$g m$^{-3}$ | running annual mean | 31.12.2010 |
| 1,3-Butadiene | 2.25 $\mu$g m$^{-3}$ | running annual mean | 31.12.2003 |
| Carbon monoxide<br>Authorities in England, Wales and Northern Ireland only | 10.0 mg m$^{-3}$ | maximum daily running 8-hour mean | 31.12.2003 |
| Authorities in Scotland only | 10.0 mg m$^{-3}$ | running 8-hour mean | 31.12.2003 |
| Lead | 0.5 $\mu$g m$^{-3}$<br>0.25 $\mu$g m$^{-3}$ | annual mean<br>annual mean | 31.12.2004<br>31.12.2008 |
| Nitrogen dioxide[a] | 200 $\mu$g m$^{-3}$ not to be exceeded more than 18 times a year<br>40 $\mu$g m$^{-3}$ | 1 hour mean<br><br>annual mean | 31.12.2005<br><br>31.12.2005 |
| Particles ($PM_{10}$) (gravimetric)[b]<br>All authorities | 50 $\mu$g m$^{-3}$ not to be exceeded more than 35 times a year<br>40 $\mu$g m$^{-3}$ | 24 hour mean<br><br>annual mean | 31.12.2004<br><br>31.12.2004 |
| Sulphur dioxide | 350 $\mu$g m$^{-3}$ not to be exceeded more than 24 times a year<br>125 $\mu$g m$^{-3}$ not to be exceeded more than 3 times a year<br>266 $\mu$g m$^{-3}$ not to be exceeded more than 35 times a year | 1 hour mean<br><br>24 hour mean<br><br>15 minute mean | 31.12.2004<br><br>31.12.2004<br><br>31.12.2005 |

a. These objectives are provisional.
b. Measured using the European gravimetric transfer sampler or equivalent.

## 1.3 Conclusions of Previous Updating and Screening Assessment 2009

Ballymoney Borough Council has previously monitored exceedances of the $PM_{10}$ 2004 daily objective and has subsequently declared an Air Quality Management Area.

Ballymoney Borough Council commissioned an air quality review and assessment in November 2008 to determine what effect a major domestic heating conversion carried out by the Northern Ireland Housing Executive (NIHE) within the AQMA may have had on $PM_{10}$ concentrations. A full copy of this report can be found in the USA 2009.

It was recommended that Ballymoney Borough Council should revoke the Ballymoney Town Air Quality Management Area for the following reasons:

1. The measurement data indicates that the annual average $PM_{10}$ concentration in 2007 and 2008 was less than half of the annual average objective (40 $\mu gm^{-3}$). Also the number of exceedences of the 50 $\mu gm^{-3}$ daily objective was considerably less than the 35 that would cause exceedance of the short-term objective (4 exceedances in 2007 and 9 exceedances in 2008).

2. The air quality modelling showed that the highest concentrations are predicted for areas north of the sampling site (around Hamilton Park/The Crescent) and south of the sampling site (around Union Street/Henry Street). These concentrations are just marginally higher than what was measured at the sampling site and are approximately half the annual average objective concentration of 40 $\mu gm^{-3}$. The modelled 90.4 percentile of daily mean concentrations was much less than the daily air quality objective for $PM_{10}$. Hence no exceedance of the annual or daily air quality objectives are predicted in Ballymoney Borough Council.

The USA 2009 stated that Ballymoney Borough Council intended to revoke the AQMA and submit a progress report in 2010 and that they would not continue to monitor PM10 levels using the BAM 1020 monitor after 31$^{st}$ December 2009 when the current

maintenance and QA/QC contracts expire. However, nitrogen dioxide levels would continue to be monitored through the use of diffusion tubes

# 2 NEW MONITORING DATA

This section provides a summary of air quality monitoring results available since the last review and assessment was completed.

## 2.1 AUTOMATIC MONITORING

A Met One BAM 1020 analyser located within the Glebeside residential development in Ballymoney carries out continuous monitoring of $PM_{10}$. Monitoring commenced at the station in December 2003. The analyser is housed within a secure air-conditioned unit.

QA/QC and data management was carried out by NPL from December 2003 – December 2004 and is currently carried out by NETCEN who validate and ratify the raw data and provide the Council with results on a twice-yearly basis. Data reports are also provided on a daily basis via e-mail, however this data is not validated.

## 2.2 $PM_{10}$ MONITORING

Fully ratified data sets for 2007 and 2008 were submitted within the USA 2009 for Ballymoney Borough Council but have also been included for information in Appendix 1 and 2 to this report.

Ratified data for 2009 shows an annual average of 16 µg $m^{-3}$ and 6 exceedances of the 50 µg $m^{-3}$ daily mean objective. This shows a decrease from 2008 where there the annual average was 18 µg $m^{-3}$ and there were 9 exceedances of the 50 µg $m^{-3}$ daily mean objective. Data capture is so far 93.5% which is above the recommended 75%. This report, which can be found in Appendix 3 of this report, therefore shows that both the annual average and daily mean air quality objectives continued to be met in 2009 in Ballymoney Borough Council and also decreased from previous years.

## 2.3 $NO_2$ DIFFUSION TUBE MONITORING

Ballymoney Borough Council carry out monitoring of $NO_2$ by diffusion tubes at eight sites within the Borough. Four of the sites are included within the UK $NO_2$ network.

**Table 2 Diffusion Tube Monitoring Site Details in Ballymoney**

| Site Ref | Site Detail | Location |
|---|---|---|
| 1N* | Kerbside | 19 Linenhall St, Ballymoney |
| 2N* | Kerbside | 8 Ballybogey Road, Ballymoney |
| 3N* | Urban Background | Opposite 16 Armour Ave, Ballymoney |
| 4N* | Urban Background | 2-4 Semicock Ave, Ballymoney |
| 6N | Kerbside | 31 Charles Street, Ballymoney |
| 7N | Kerbside | Opposite 51 Queen Street, Ballymoney |
| 8N | Kerbside | Meetinghouse Street, Ballymoney |
| 9N | Kerbside | Castle Street, Ballymoney |

* $NO_2$ Network Site
*Kerbside = 1-5m from kerb, urban background = at least 50m from the kerb of any major road.*

Diffusion tubes are analysed by Gradko who currently meet all relevant standards

Diffusion tubes frequently exhibit bias (over- or under-read) relative to the chemiluminescence analyser (the reference technique for $NO_2$), and the Guidance states that it is necessary to correct for any such bias, when using diffusion tube results for review and assessment purposes. As Ballymoney Borough Council does not have any permanent automatic $NO_2$ monitoring sites, they are not able to carry out the necessary intercomparison locally. Instead, information was obtained from a summary spreadsheet of Local Authority co-location studies prepared by Air Quality Consultants and available via the Air Quality Review and Assessment website, at http://www.uwe.ac.uk/aqm/review. A bias adjustment factor of 0.99 was taken from the spreadsheet of bias adjustment factors (v.03/10).

A table of the 2009 nitrogen dioxide concentrations can be found in appendix 4 which shows that Ballymoney Borough Council has not measured an annual mean concentration at any site greater than 40 µg/$m^3$

## 3.0 NEW LOCAL DEVELOPMENTS

A Progress Report should address any local developments that might affect air quality. This includes new Part A, B or C industrial processes, of types specified in Appendix 2 (E) of LAQM.TG(03). It is also relevant to include any processes with substantially changed emissions. New landfill sites or quarries with relevant public exposure should also be included. It is only necessary to consider developments that have actually been granted planning permission.

### 3.1 New Industrial Processes

No new Part A or B industrial processes (as included in the list in Appendix 2 of the Technical Guidance LAQM.TG (03)) in Ballymoney have commenced or changed significantly.

### 3.2 New Developments

There are no new developments granted planning permission (or which are awaiting consent) that are likely to have a significant impact on local air quality through increased traffic flow.

## 4.0 ACTION PLAN PROGRESS

| Action Plan measure/target | Original timescale | Progress with measure | Outcome to date | Comments |
|---|---|---|---|---|
| NIHE conversion scheme | To be completed by October 2007 | Scheme completed February 2008 | 360 homes converted within AQMA with further homes converted adjacent to AQMA | NIHE also installed solar panels on 30 homes within AQMA |
| Warm Homes Scheme Promotion | Ongoing | Scheme promoted throughout borough in 07/08 | 165 Insulation measures at a value of £101,541.71<br>51 Central Heating measures at a value of £181,229.84 | Promotion of scheme ongoing in 09/10 |
| Energy Efficiency Promotion | Ongoing | Dedicated energy efficiency officer employed by Ballymoney Borough Council | Talks given to local residents within AQMA. | Ongoing referrals to appropriate schemes. |
| Bonfire Guidance and controls | Ongoing | Safer Bonfire Competition held July 2009 | Judges noted improvement on suitability of materials burnt on bonfire. | Alternatives to bonfires in from of beacons being promoted in 2010 |

## 5.0 CONCLUSION

Ballymoney Borough Council has previously monitored exceedances of the $PM_{10}$ 2004 daily objective and has subsequently declared an Air Quality Management Area. Ballymoney have continued to monitor local levels of $PM_{10}$ throughout 2009 and have decided to revoke the existing AQMA.

Nitrogen Dioxide concentrations throughout Ballymoney are below the annual mean objectives in 2009.

## 6.0 RECOMMENDATIONS

The subsequent reporting required by Ballymoney Borough Council is therefore to revoke the AQMA, discontinue monitoring of particulate matter, to continue to monitor nitrogen dioxide via diffusion tubes and to submit reports as required via the local air quality management scheme guidance.

## Appendix 1

## Produced by AEA Energy & Environment on behalf of Ballymoney Borough Council

## BALLYMONEY
## 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 | 58 |
| Number Low | 7911 |
| Maximum 15-minute mean | 222 µg $m^{-3}$ |
| Maximum hourly mean | 222 µg $m^{-3}$ |
| Maximum running 8-hour mean | 105 µg $m^{-3}$ |
| Maximum running 24-hour mean | 87 µg $m^{-3}$ |
| Maximum daily mean | 79 µg $m^{-3}$ |
| Average | 20 µg $m^{-3}$ |
| Data capture | 91.2 % |

+ $PM_{10}$ as measured by a BAM using a factor of 0.83333 for Indicative Gravimetric Equivalence
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 | 0 |

## Appendix 2

## Produced by AEA Energy & Environment on behalf of Ballymoney Borough Council

## BALLYMONEY
## 01 January to 30 June 2008

**These data are provisional and may be subject to further quality control**

| POLLUTANT | $PM_{10}$*+ |
|---|---|
| Number Very High | 0 |
| Number High | 0 |
| Number Moderate | 60 |
| Number Low | 4138 |
| Maximum 15-minute mean | 143 µg $m^{-3}$ |
| Maximum hourly mean | 143 µg $m^{-3}$ |
| Maximum running 8-hour mean | 98 µg $m^{-3}$ |
| Maximum running 24-hour mean | 82 µg $m^{-3}$ |
| Maximum daily mean | 66 µg $m^{-3}$ |
| Average | 19 µg $m^{-3}$ |
| Data capture | 96.7 % |

+ $PM_{10}$ as measured by a BAM using a factor of 0.83333 for Indicative Gravimetric Equivalence
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 $m^{-3}$ | 8 | 8 |
| $PM_{10}$ Particulate Matter (Gravimetric) | Annual mean > 40 µg $m^{-3}$ | 0 | 0 |

**Appendix 3**

**Produced by AEA on behalf of Ballymoney Borough Council**

# BALLYMONEY
# 01 January to 31 December 2009

**These data have been fully ratified by AEA**

| POLLUTANT | $PM_{10}$*+ |
|---|---|
| Number Very High | 0 |
| Number High | 15 |
| Number Moderate | 26 |
| Number Low | 8097 |
| Maximum 15-minute mean | 284 $\mu gm^{-3}$ |
| Maximum hourly mean | 284 $\mu gm^{-3}$ |
| Maximum running 8-hour mean | 166 $\mu gm^{-3}$ |
| Maximum running 24-hour mean | 102 $\mu gm^{-3}$ |
| Maximum daily mean | 93 $\mu gm^{-3}$ |
| Average | 16 $\mu gm^{-3}$ |
| Data capture | 93.5 % |

+ $PM_{10}$ instruments: BAM using a factor of 0.83333 for Indicative Gravimetric Equivalence
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 $\mu gm^{-3}$ | 6 | 6 |
| $PM_{10}$ Particulate Matter (Gravimetric) | Annual mean > 40 $\mu gm^{-3}$ | 0 | - |

## Appendix 4 Nitrogen Dioxide Diffusion Tubes Results 2009

| Tube cation | Jan | Feb | Mar | Apr | May | June | Jul | Aug | Sep | Oct | Nov | Dec | Ave | B A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1N** | 37.40 | 36.93 | 31.51 | 34.03 | 26.44 | 30.47 | 25.87 | 23.26 | 26.64 | 38.13 | 32.94 | 40.20 | 31.99 | **31.67** |
| **2N** | 22.22 | 20.02 | 18.28 | 20.20 | 18.73 | 22.80 | 17.70 | 11.79 | 16.40 | 22.76 | 23.41 | 34.14 | 20.70 | **18.63** |
| **3N** | 14.11 | 13.60 | 8.38 | 10.20 | 7.81 | 7.96 | 6.50 | 4.93 | 7.78 | 13.20 | 14.45 | 20.28 | 10.77 | **9.69** |
| **4N** | 19.28 | 19.41 | 11.95 | 10.20 | 8.51 | 9.43 | 7.83 | 6.31 | 9.02 | 15.90 | 13.52 | 21.03 | 12.70 | **11.43** |
| **6N** | 27.98 | 25.27 | 24.50 | 21.55 | 23.66 | 20.95 | 19.70 | 9.91 | 25.50 | 30.34 | 25.55 | 27.46 | 23.53 | **21.18** |
| **7N** | 37.93 | 24.09 | 31.34 | 28.75 | 27.65 | 26.73 | 23.57 | 20.97 | 26.65 | 17.36 | 31.69 | 36.42 | 27.76 | **24.99** |
| **8N** | 45.75 | 37.61 | 37.07 | 34.27 | 38.35 | 37.59 | 36.19 | 25.94 | 36.20 | 32.24 | 35.18 | 40.59 | 36.42 | **32.77** |
| **9N** | 21.99 | 24.80 | 19.63 | 16.32 | 14.35 | 15.21 | 11.91 | 11.63 | 17.16 | 20.20 | 25.05 | 25.71 | 18.66 | **16.80** |

Appendix 5