







CARRICKFERGUS BOROUGH COUNCIL

2011 AIR QUALITY MANAGEMENT PROGRESS REPORT

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Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Progress Report is a requirement of the Fourth Round of Review and Assessment and is a requirement for all local authorities. The Report has been undertaken in accordance with the Technical Guidance LAQM.TG (09) and associated tools (as updated in 2010).

This Progress Report considers all new monitoring data and assesses the data against the Air Quality Strategy Objectives. It also considers any development changes that may have an impact on air quality as well as updating on any relevant strategy and policy changes.

Having considered the latest monitoring data and development updated, it is concluded that the air quality objectives for all pollutants set out in the Regulations will be met. The recommendations for Carrickfergus are as follows:

- Continue to monitor pollution levels in the borough to ensure continuing compliance to the air quality objectives.
- Proceed to an Updating Screening and Assessment in 2012.

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1 Introduction

1.1 Description of Local Authority Area

The Borough of Carrickfergus is located on the Northern shore of Belfast Lough, stretching from Greenisland in the southwest to Whitehead in the east. The main settlements in the area are located along a low lying coastal strip. Further inland the ground rises to a height of 275 metres at Knockagh which forms part of the southernmost reaches of the Antrim Plateau. The borough takes in a total area of 31.67 square miles.

The area enjoys relatively mild winters and warm summers. The average rainfall is approximately 945 mm/year and the south westerly prevailing winds reach average speeds of 6-7 metres/second.

The population of the borough has increased from 28,500 in 1981 to a revised figure of 40,000 in June 2010.

One of the major air pollutant sources in the borough is from road traffic, particularly along the A2 which is the main road to and from Belfast. The key industrial source in the area is AES Kilroot Power Station. A number of homes in the area continue to burn solid fuel although this number has declined over the years due to the arrival of Phoenix piped natural gas and subsequent Northern Ireland Housing Executive home improvement schemes.

1.2 Purpose of Progress Report

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

They are not intended to be as detailed as USA reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Strategy (AQS) 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 Strategy Objectives

The AQS 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. This table shows the objectives in units of microgrammes per cubic metre ($\mu\text{g}/\text{m}^3$). For carbon monoxide the units used are milligrammes per cubic metre (mg/m^3). Table 1 includes the number of permitted exceedences in any given year (where applicable).

Table 1 - AQS Objectives included in Regulations for the purpose of LAQM in Northern Ireland.

| Pollutant | | | Date to be Achieved by |
|--|--|-----------------------------------|------------------------|
| | Concentration | Measured as | |
| Benzene (C ₆ H ₆) | 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 (C ₄ H ₆) | 2.25 µg/m ³ | Running annual mean | 31.12.2003 |
| Carbon Monoxide (CO) | 10.0 mg/m ³ | Maximum daily 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 (NO ₂) | 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 (SO ₂) | 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

Air quality monitoring for NO₂ and SO₂ using diffusion tubes has been ongoing in Carrickfergus since March 1997. Real time monitoring of SO₂ and PM₁₀ commenced in July 2002 at the Council's Rosebrook Grove Site and continues to date.

The first stage of Review and Assessment concluded that NO₂ from roads and industrial sources, SO₂ from industrial and domestic sources and PM₁₀ from industrial and domestic sources should be examined during the second stage review.

The second stage concluded that SO₂ and PM₁₀ from industrial sources and NO₂ from industrial and road sources were not a source of concern.

The third stage focused on PM₁₀ and SO₂. Modelling of these two pollutants resulted in predicted exceedences and two Air Quality Management Areas (AQMA) were declared in Carrickfergus town and Greenisland.

The following fourth stage assessment updated the fuel use survey within the AQMA. This data combined with detailed modelling predicted that no exceedences of the PM₁₀ or SO₂ objectives were likely at any relevant receptor locations. As a result of this the two AQMA were revoked in 2007.

The 2009 USA identified potential exceedence of NO₂ annual mean objective at the junction of Belfast Road (A2) and Davys Street up to and including the junction with Minorca Place (B58), where relevant exposure is present. The USA recommended carrying out a Detailed Assessment for this location to assess the compliance of the annual mean NO₂ objective. In their comments, Northern Ireland Department of Environment recommended that PM₁₀ also be considered at this location.

The Detailed Assessment for PM₁₀ and NO₂ at the junction of Minorca Place, which was completed in February 2011, concluded that no exceedences of the AQS objectives would occur at receptor locations within the area and that it was not necessary to declare an AQMA at the junction.

The 2010 Progress Report confirmed that all AQS objectives were being met in the borough, therefore there was no need to proceed to Detailed Assessment for any pollutants.

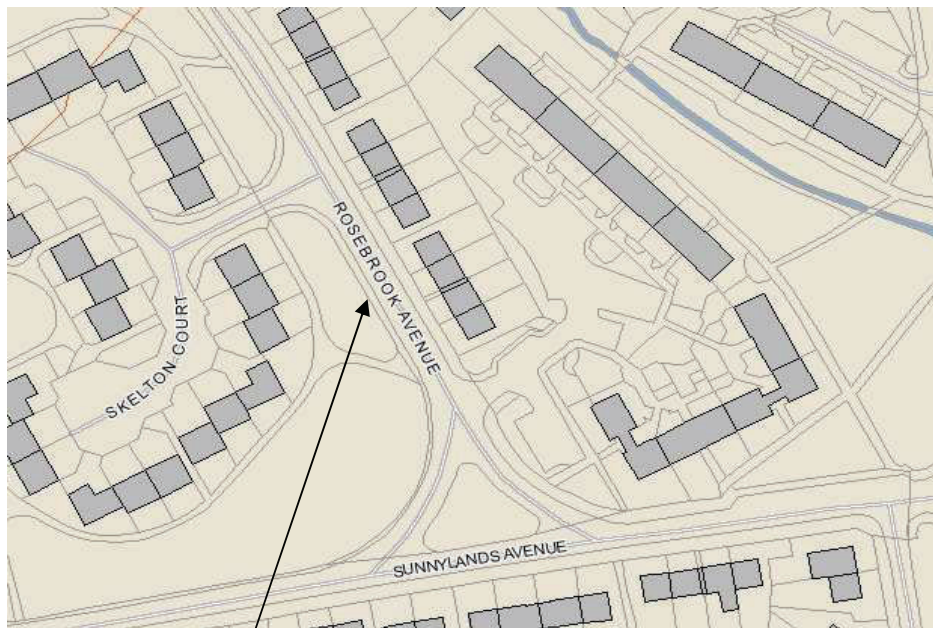
2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Carrickfergus Borough Council currently has one air quality monitoring station located at an urban background site on Rosebrook Avenue Carrickfergus. Monitoring began operation in 2002 and continues at present. Pollutants measured at the site are PM₁₀ and SO₂.

Figure 1 - Map of Automatic Monitoring Site – Rosebrooke Avenue



Location of monitoring
station at Rosebrook Ave,
Carrickfergus

Table 2 - Details of Automatic Monitoring Site – Rosebrook Avenue

| Site Name | Site Type | OS Grid Reference (X, Y) | | Pollutants Monitored | Monitoring Technique | In AQMA? | Relevant Exposure? (Y/N with distance (m) to relevant exposure) | Distance to Kerb of Nearest Road (N/A if not applicable) | Does this Location Represent Worst-case Exposure? |
|---------------------|---------------------|-----------------------------|--------|------------------------------------|---------------------------|-------------|---|---|---|
| Rosebrook Avenue | Urban Background | 341129 | 387998 | PM ₁₀ , SO ₂ | TEOM & UV Spectroscopy | N | Y (5m) | 1m | Y |

Table 3 - Details of Non- Automatic Monitoring Sites

| Site Name | Site Type | OS Grid Ref | | Pollutants Monitored | In AQMA? | Relevant Exposure? (Y/N with Distance (m) to Relevant Exposure) | Distance to Kerb of Nearest Road (N/A if not applicable) | Worst-case Location? |
|---|-------------------|-------------|--------|----------------------|----------|---|--|----------------------|
| (Site 1) 32 Mullaghmore Park Greenisland | Urban Background. | 336901 | 385621 | NO ₂ | N | Y (30m) | 3m | N |
| (Site 2) College North Road Carrickfergus | Roadside | 341147 | 388596 | NO ₂ | N | Y (5m) | 3m | Y |
| (Site 3) Railway Station, Fergus Avenue Carrickfergus | Roadside | 341204 | 387692 | NO ₂ | N | Y (5m) | 5m | Y |
| (Site 4) 93 Belfast Road Carrickfergus | Roadside | 339911 | 386741 | NO ₂ | N | Y (1m) | 3m | Y |
| (Site 5) Islandmagee Road, Whitehead | Roadside | 347309 | 392433 | NO ₂ | N | Y (1m) | 3m | Y |
| (Site 6) Model PS Belfast Road, Carrickfergus | Roadside | 340781 | 387100 | NO ₂ | N | Y (1m) | 2m | Y |
| (Site 7) Lough Road, Loughmourne | Rural | 341252 | 391956 | NO ₂ | N | N | N/A | N |

| Site Name | Site Type | OS Grid Ref | | Pollutants Monitored | In AQMA? | Relevant Exposure? (Y/N with Distance (m) to Relevant Exposure) | Distance to Kerb of Nearest Road (N/A if not applicable) | Worst-case Location? |
|--|-----------|-------------|--------|----------------------|----------|---|--|----------------------|
| (Site 8) 42 Albert Road, Carrickfergus | Roadside | 341186 | 387558 | NO ₂ | N | Y (1m) | 1m | Y |
| (Site 9) 27 Upper Road, Greenisland | Roadside | 336386 | 385717 | NO ₂ | N | Y (1m) | 1m | Y |
| (Site 10) 59 Shore Road, Greenisland | Roadside | 337969 | 384916 | NO ₂ | N | Y (1m) | 1m | Y |
| (Site 11) 28 Bentra Road, Whitehead | Rural | 345357 | 391988 | NO ₂ | N | N | N/A | N |
| (Site 12) 186 Shore Road, Greenisland | Roadside | 338411 | 385380 | NO ₂ | N | Y (1m) | 1m | Y |
| (Site 13) Victoria Road | Roadside | 342354 | 388216 | NO ₂ | N | Y (1m) | 1m | Y |
| (Site 14) Minorca Place | Roadside | 340897 | 387381 | NO ₂ | N | Y (1m) | 1m | Y |

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO₂)

2.2.1.1 Automatic Monitoring Data

No automatic monitoring was carried out for NO₂ within the Borough of Carrickfergus in 2010.

2.2.1.2 Diffusion Tube Monitoring Data

Carrickfergus Borough Council uses diffusion tubes supplied by Eurofins using the 50% Triethanolamine (TEA) in acetone preparation method. Eurofins (through their supplier Environmental Scientifics Group) participates in the WASP scheme organised by the Health and Safety Laboratory and is in the 'good' category.

With regard to the application of a bias adjustment factor for the diffusion tubes, the technical guidance LAQM.TG (09) and the LAQM Support Helpdesk¹ recommend use of a local bias adjustment factor where available and relevant to diffusion tube sites. As Carrickfergus does not operate a continuous monitoring site with co-located diffusion tubes within the borough, the bias adjustment figure has been derived from the national bias adjustment calculator sheet available on the LAQM Support website². The bias adjustment factor for 2010 is 0.83 (based on 3 studies).

The results for 2010 show no exceedences of the NO₂ annual mean objectives were recorded.

Table 4 - Results of Nitrogen Dioxide Diffusion Tube Monitoring

| Location | Within AQMA? | Data Capture for Monitoring Period % | Data Capture for Full Calendar Year 2010 % | Annual Mean Concentrations (µg/m ³) | | |
|--|--------------|--------------------------------------|--|---|-------------|-------------|
| | | | | 2008 | 2009 (0.83) | 2010 (0.83) |
| G'Island 27 Upper Road | N | 100 | 100 | 24.8 | 24.1 | 23.1 |
| G'Island 32 Mullaghmore Park | N | 100 | 100 | 8.2 | 8.5 | 17.9 |
| G'Island 59 Shore Road | N | 100 | 100 | 23.0 | 23.2 | 31.4 |
| G'Island 186 Shore Road | N | 92 | 92 | 26.5 | 28.8 | 28.6 |
| C'Fergus 93 Belfast Road | N | 92 | 92 | 26.4 | 24.9 | 20.1 |
| C'Fergus Model PS Belfast Road | N | 92 | 92 | 26.4 | 24.9 | 26.8 |
| Lamp Post Minorca Place/Tesco junction | N | 83 | 83 | N/A | N/A | 28.5 |
| C'Fergus 42 Albert Road | N | 100 | 100 | 20.8 | 22.1 | 20.5 |
| C'Fergus Railway Stn, Fergus Ave | N | 92 | 92 | 15.5 | 17.9 | 16.5 |
| C'Fergus College North Road | N | 83 | 83 | 12.8 | 11.9 | 21.6 |
| Loughmourne Lough Rd | N | 100 | 100 | 5.8 | 5.6 | 11.6 |

¹ <http://laqm.defra.gov.uk/>

² Available for download at <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

| Location | Within AQMA? | Data Capture for Monitoring Period % | Data Capture for Full Calendar Year 2010 % | Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$) | | |
|--|--------------|--------------------------------------|--|---|-------------|-------------|
| | | | | 2008 | 2009 (0.83) | 2010 (0.83) |
| C'Fergus Victoria Road Lamp post 11 | N | 92 | 92 | 21.9 | 25.2 | 23.2 |
| W'Head 28 Bentra Rd | N | 100 | 100 | 7.7 | 8.4 | 9.2 |
| W'Head Islandmagee Road | N | 100 | 100 | 12.1 | 17.0 | 17.5 |

In bold, exceedence of the NO₂ annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

2.2.2 Particulates (PM₁₀)

Carrickfergus Borough Council monitors PM₁₀ at the Rosebrook Avenue continuous monitoring site. Data capture for 2010 was only 28% therefore the data has been annualised, details are provided in Appendix A. The data has also been VCM³ corrected and details provided in appendix A.

The PM₁₀ levels remain well below the air quality objectives at the site and have shown no increase since 2009. Despite the low data capture meaning the results should be viewed with caution it is suggested that there would be no issue with meeting the AQS objectives as the levels are so far below the limits.

Table 5 - Results of PM₁₀ Automatic Monitoring - Comparison with Annual Mean Objective

| Location | Within AQMA? | Data Capture for Monitoring Period % | Data Capture for Full Calendar Year 2010 % | Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$) | | |
|-------------------------|--------------|--------------------------------------|--|---|------|------|
| | | | | 2008 | 2009 | 2010 |
| Rosebrook Avenue | N | 28% | 28% | 18 | 16 | 16 |

In bold, exceedence of the PM₁₀ annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

³ VCM: Volatile Correction Model

Table 6 - Results of PM₁₀ Automatic Monitoring - Comparison with 24-hour Mean Objective

| Location | Within AQMA? | Data Capture for Monitoring Period % | Data Capture for Full Calendar Year 2010 % | Number of Daily Means > 50µg/m ³ * | | |
|-------------------------|--------------|--------------------------------------|--|---|--------|--------|
| | | | | 2008 | 2009 | 2010 |
| Rosebrook Avenue | N | 28% | 28% | 0 | 0 (23) | 0 (20) |

In bold, exceedence of the PM₁₀ daily mean AQS objective (50 µg/m³ – not to be exceeded more than 35 times per year)

* If data capture < 90%, the 90.4th percentile of daily means is included in brackets (in µg/m³)

2.2.3 Sulphur Dioxide

There is currently continuous monitoring of sulphur dioxide (SO₂) undertaken by Carrickfergus Borough Council at one location in the area at the Rosebrook Avenue site. The comparison of monitoring with the objectives is shown below.

The 2010 results show that the SO₂ objectives are continuing to be met at this site.

Table 7 - Results of SO₂ Automatic Monitoring - Comparison with Objectives

| Location | Within AQMA AQMA? | Data Capture for Monitoring Period % | Data Capture for Full Calendar Year 2010 % | Number of * | | |
|-------------------------|-------------------|--------------------------------------|--|--|--------------------------------------|-------------------------------------|
| | | | | 15 Minute Means > 266µg/m ³ | Hourly Means > 350 µg/m ³ | Daily Means > 125 µg/m ³ |
| Rosebrook Avenue | N | 69 | 69 | 0 (43) | 0 (35) | 0 (13) |

In bold, exceedence of the relevant AQS objective (15-min mean = 35 allowed/year ; 1-hour mean = 24 allowed/year; 24-hour mean = 3 allowed/year)

* If data capture < 90%, the relevant percentiles are included in brackets (in µg/m³): (15-min mean = 99.9th ; 1-hour mean = 99.7th ; 24-hour mean = 99.2th percentile)

2.2.4 Summary of Compliance with AQS Objectives

Carrickfergus Borough Council have carried out passive monitoring for NO₂ across the borough and continuous monitoring for PM₁₀ and SO₂ at the Rosebrooke continuous monitoring station. No exceedences were recorded for any of these pollutants during 2010.

Carrickfergus Borough Council has examined the results from monitoring in the borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

Carrickfergus Borough Council confirms there are no newly identified or newly implemented road traffic sources, which may have an impact on air quality within the borough.

3.2 Other Transport Sources

Carrickfergus Borough Council confirms there are no newly identified or newly implemented other transport sources, which may have an impact on air quality within the Local borough.

3.3 Industrial Sources

Carrickfergus Borough Council confirms there are no newly identified or newly implemented industrial sources, which may have an impact on air quality within the borough.

3.4 Commercial and Domestic Sources

Carrickfergus Borough Council confirms there are no newly identified or newly implemented commercial and domestic sources, which may have an impact on air quality within the borough.

3.5 New Developments with Fugitive or Uncontrolled Sources

Carrickfergus Borough Council confirms there are no newly identified or newly implemented new developments with fugitive or uncontrolled sources, which may have an impact on air quality within the borough.

Carrickfergus Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the borough.

4 Local / Regional Air Quality Strategy

Carrickfergus Borough Council does not have a specific local or regional air quality strategy. Regarding air pollution, Carrickfergus Borough Council acts in accordance with the Environment (Northern Ireland) Order 2002.

5 Planning Applications

Carrickfergus Borough Council is not aware at the time of writing of any planning applications that may have an impact on air quality within the borough.

6 Air Quality Planning Policies

Carrickfergus Borough Council's planning policies are defined in the Belfast Metropolitan Area Plan 2015 (published as a draft in 2004). Carrickfergus has its own section in this document (Part 4 Volume 4). Elements of this plan will have a positive impact on air quality although it is not specifically stated as being for the purpose of Air Quality improvement. For example in the town centre of Carrickfergus a plan to increase pedestrian priority areas and expand the Park and Ride at Carrickfergus Railway station to reduce the numbers of cars in the town centre will improve Air Quality.

7 Local Transport Plans and Strategies

Carrickfergus does not currently have a Local Transport Plan in place. Local transport have been integrated into the afore-mentioned Belfast Metropolitan Area Plan 2015, however the plan does not have specific mention of air quality aims.

8 Climate Change Strategies

Carrickfergus does not currently have a climate change strategy. The Council has developed a Sustainable Development Audit and Action Plan 'Living as if we intend to stay here' (2010) which includes air quality aims. The main aim is to 'enhance air quality' (in the borough). Air quality is also mentioned with respect to transport stating that '*consideration could be given how energy used for staff travel can be decreased*', as improvement in air quality is expected to arise from this initiative.

9 Implementation of Action Plans

Carrickfergus Borough Council does not have any AQMAs. The two AQMAs that were declared for PM₁₀ and SO₂ in the borough were revoked in 2007.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Carrickfergus Borough Council has monitored NO₂, PM₁₀ and SO₂ in 2010 using both passive and continuous monitoring. The results from 2010 show there were no exceedences of the Air Quality Strategy (AQS) objectives for any of the pollutants measured and therefore there is no need to proceed to a Detailed Assessment.

10.2 Conclusions relating to New Local Developments

Carrickfergus Borough Council has not identified any new or newly planned developments within the borough that may have an impact on air quality.

10.3 Proposed Actions

Proposed actions for Carrickfergus Borough Council are:

- Continue to monitor pollution levels in the borough to ensure continuing compliance to the AQS objectives.
- Proceed to an Updating Screening and Assessment in 2012.

11 References

- Local Air Quality Management Technical Guidance LAQM.TG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- Local Air Quality Management Policy Guidance LAQM.PG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- Carrickfergus Borough Council 2010 LAQM Annual Progress Report
- Carrickfergus Borough Council 2009 LAQM Updating Screening and Assessment
- Carrickfergus Borough Council 2008 LAQM Annual Progress Report
- Carrickfergus Borough Council 2007 LAQM Annual Progress Report

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Diffusion tubes were analysed by Eurofins Laboratories (supplied by ESG) using the 50% Triethanolamine (TEA) in acetone preparation method. Using the national bias adjustment spreadsheet a bias adjustment factor of 0.83 is given based on 3 studies.

Discussion of Choice of Factor to Use

With regard to the application of a bias adjustment factor for the diffusion tubes, the technical guidance LAQM.TG (09) and the LAQM Support website ⁴ recommend use of a local bias adjustment factor where available and relevant to diffusion tube sites. However, there was no suitable co-location site, so the national bias adjustment factor was used.

PM10 Monitoring Adjustment

Particulates are monitored by TEOM⁵ which is not gravimetrically equivalent to the reference method and requires correction using VCM model⁶. The parameters used in producing the corrected data are summarised in Table 8 below.

Table 8 - VCM Correction Settings

| Summary | Text |
|--|--|
| Site Name | Carrickfergus Rosebrook Avenue |
| Organisation | Carrickfergus |
| Start Date | 01/01/2010 |
| End Date | 01/01/2011 |
| TEOM data already corrected with 1.3 factor | No |
| EPA Constant A | 3 |
| EPA Constant B | 1.029999971 |
| Instrument Temperature | 25 |
| Instrument Pressure | 1013 |
| Instrument reports to local ambient readings | No |
| Timescale | Daily |
| Pressure Site | Harwell - Partisol SO4 (HA9) |
| Pressure Site Warning | BP Distant site (461km). |
| Temperature Site | Harwell - Partisol SO4 (HA9) |
| Temperature Site Warning | TMP Distant site (461km). |
| FDMS Site 1 | Belfast Centre AURN (BE1) |
| FDMS Site 1 Warning | FDMS1 Data capture 71%. FDMS1 Correction includes unratified data. |
| FDMS Site 2 | Plymouth Saltash Kerbside (PL1) |

⁴ <http://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html>

⁵ TEOM: Tapered Element Oscillating Microbalance

⁶ <http://www.volatile-correction-model.info/Default.aspx>

| Summary | Text |
|---------------------|--|
| FDMS Site 2 Warning | FDMS2 Data capture 46%. FDMS2 Correction includes unratified data. |
| FDMS Site 3 | Belfast Centre FDMS trial (BE7) |
| FDMS Site 3 Warning | Cannot find third FDMS site with data for chosen dates. FDMS3 Data capture 0%. |

Short-term to Long-term Data Adjustment

PM₁₀ continuous data have been annualised based on Technical Guidance LAQM.TG(09) using 2 background sites. A summary of the annualisation factors is shown in Table 9 below.

Table 9 – PM₁₀ Automatic Data Annualisation Factors

| Site | Site Type | Annual Mean | Period Mean | Ratio |
|---------------------|------------|-------------|-------------|-------|
| Strabane Springhill | Background | 22.69 | 22.82 | 0.99 |
| Cookstown | Background | 23.19 | 27.90 | 0.83 |
| | | | Average | 0.91 |

QA/QC of Automatic Monitoring

All data from the Carrickfergus Air Quality Station are managed by external consultants (AEA) to quality procedures developed under the UK National Network. The data management processes represent best practice and fully meet the requirements set out in LAQM TG(09).

All data are screened and scaled (on the basis of site calibrations) and the final data sets presented within this report have benefited from a full process of data ratification, including through additional data quality checks that include site UKAS quality control audits and a final data ratification process that corrects data for instrument sensitivity drift between routine calibrations

QA/QC of Diffusion Tube Monitoring

Eurofins are a UKAS accredited laboratory. Tube preparation and analysis follows operating procedures HS/WI/1015 (NO₂). Nitrogen dioxide analysis procedures are compliant with the Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for users and laboratories (February 2008).

Appendix B – Monitoring Data

Table 10 - 2010 Passive Monitoring Monthly Mean Measurements ($\mu\text{g}/\text{m}^3$)

| Location 2010 | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | bias adjusted |
|--|------|------|-------|------|------|------|------|------|------|------|------|------|---------------|
| G'Island 27 Upper Road | 28.0 | 40.7 | 36.3 | 30.7 | 22.7 | 22.6 | 24.4 | 21.1 | 25.5 | 27.6 | 38.1 | 16.9 | 23.1 |
| G'Island 32 Mullaghmore Park | 34.0 | 49.1 | 28.1 | 12.7 | 6.8 | 27.5 | 7.0 | 6.0 | 7.4 | 10.5 | 38.8 | 31.7 | 17.9 |
| G'Island 59 Shore Road | 15.0 | 44.6 | 119.5 | 33.4 | 29.4 | 42.5 | 23.7 | 26.8 | 16.8 | 33.3 | 27.8 | 40.8 | 31.4 |
| G'Island 186 Shore Road | | 44.9 | 45.3 | 34.6 | 34.3 | 31.1 | 26.5 | 31.1 | 38.5 | 35.9 | 18.0 | 39.3 | 28.6 |
| C'Fergus 93 Belfast Road | | 43.1 | 35.0 | 30.1 | 20.8 | 26.9 | 21.7 | 21.1 | 25.7 | 30.3 | 11.3 | 0.0 | 20.1 |
| C'Fergus Model PS Belfast Road | 27.0 | 59.0 | 43.3 | | 44.2 | 23.8 | 27.0 | 33.5 | 35.4 | 37.1 | 0.0 | 24.5 | 26.8 |
| Lamp Post Minorca Place/Tesco junction | | | 49.9 | 40.2 | 35.7 | 32.0 | 22.9 | 27.4 | 33.7 | 39.5 | 29.8 | 31.7 | 28.5 |
| C'Fergus 42 Albert Road | 38.0 | 35.8 | 33.0 | 28.9 | 22.9 | 12.1 | 17.1 | 15.4 | 24.7 | 18.8 | 13.4 | 36.2 | 20.5 |
| C'Fergus Railway Stn, Fergus Ave | 41.0 | 23.9 | 29.4 | | 13.8 | 6.6 | 11.3 | 9.6 | 15.2 | 28.2 | 32.2 | 8.0 | 16.5 |
| C'Fergus College North Road | | 33.1 | 36.6 | | 19.6 | 22.6 | 11.1 | 17.5 | 25.0 | 23.8 | 17.6 | 53.8 | 21.6 |
| Loughmourne Lough Rd | 17.0 | 16.6 | 10.0 | 9.9 | 4.6 | 3.9 | 6.1 | 3.6 | 4.2 | 6.7 | 43.9 | 40.7 | 11.6 |
| C'Fergus Victoria Road Lamp post 11 | 34.0 | 38.1 | 31.2 | 31.0 | 24.6 | | 16.7 | 15.1 | 20.5 | 22.7 | 25.7 | 47.2 | 23.2 |
| W'Head 28 Bentra Rd | 40.0 | 13.2 | 14.4 | 8.7 | 5.6 | 5.4 | 5.8 | 5.1 | 8.2 | 10.6 | 0.0 | 15.4 | 9.2 |
| W'Head Islandmagee Road | 38.0 | 24.0 | 27.3 | 16.8 | 11.6 | 10.9 | 10.4 | 9.0 | 16.8 | 15.5 | 27.9 | 45.1 | 17.5 |