



**Air Quality Updating and Screening Assessment  
for  
Magherafelt District Council**

In fulfilment of the Environment (NI) Order 1995  
Local Air Quality Management

May 2012

***Magherafelt District Council - Northern Ireland***

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## **Executive Summary**

Funding continues to be received from the Department of the Environment (DOENI) to carry out monitoring of nitrogen dioxide (NO<sub>2</sub>) on an on-going basis in order to monitor trends over time and validate the conclusions drawn from previous reviews.

The overarching objective of the monitoring activity is to maintain or improve human health. This objective to date has been achieved in sites 3 - 8 as data collected confirms that levels of this pollutant met the standards set.

Based on monitoring data it was evident that concentrations measured at site 2 were exceeding the standard set for NO<sub>2</sub>. Additional sites were identified in the area surrounding site 2 in order to gain a comprehensive overview of the air quality standard in this area. DOENI has accepted the content and conclusions of Detailed Assessment MDC/DA/02 submitted in September 2012. An Air Quality Management Area has now been formally declared on Church Street and lower King Street.

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# **1 Introduction**

## **1.1 Description of Local Authority Area**

The district of Magherafelt is located in the centre of Northern Ireland, stretching from Lough Neagh and the river Bann in the east, into the Sperrin mountains in the west and is divided by the Moyola river.

Magherafelt is a strategically located district within Northern Ireland. It lies on the axis of the main A29 north-south route and the east-west M2/A6 Euro-route and is within 45 minutes drive of major airports and main harbours.

Historically, agriculture has been the cornerstone of the area's economy and agribusiness remains a vital contributor today with an increasing number of food processing and manufacturing facilities. Over the past few decades the economic base has expanded and the area now boasts strong construction and manufacturing industries encompassing domestic, agricultural and industrial sectors together with related businesses in engineering and timber. Mineral extraction significantly exploits the natural resources of the area. The largest number of employees in the area are involved in the service sector.

Magherafelt District Council area covers approximately 217 square miles and has a current population of 39,500.

## **1.2 Purpose of Report**

This report fulfils the requirements of the Local Air Quality Management process as set out in the Environment (Northern Ireland) Order 2002, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

## **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 1.1. This table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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**Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in Northern Ireland.**

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

## **1.4 Summary of Previous Review and Assessments**

Magherafelt District Council in February 2001 submitted a "1<sup>st</sup> Stage Review and Assessment of Air Quality". Using DETR guidance documents, the Review and Assessment considered pollutants of concern to determine whether or not a Second Stage Review and Assessment was required. The results of the 1<sup>st</sup> Stage Review and Assessment are summarised below.

<b>POLLUTANT</b>	<b>2<sup>ND</sup> STAGE REVIEW AND ASSESSMENT NEEDED</b>
Carbon Dioxide	No
Benzene	No
1,3 Butadiene	No
Lead	No
Nitrogen Dioxide	Yes
Sulphur Dioxide	Yes
PM <sub>10</sub>	Yes

A "2<sup>nd</sup> Stage Review and Assessment of Air Quality" was submitted in April 2004. The pollutants highlighted above were subject to further scrutiny and the conclusion of the report in part prepared by NETCEN was that there was no need to proceed to a Stage 3 Review and Assessment for SO<sub>2</sub>, NO<sub>2</sub> or PM<sub>10</sub>.

A "Progress Report on Air Quality Management" was submitted in April 2005. A previous NETCEN report predicted exceedence of the air quality objective for nitrogen dioxide in 2005 at site 6, however it was stated that the proposed A6 Toome by-pass would ease the weight of traffic on that road significantly and that an exceedence would not be likely. The 2005 report confirmed that the by-pass takes the bulk of traffic away from it's original route thus reducing the impact of traffic on receptors close to the monitoring location. Results for site 6 showed a significant lowering of the annual average concentration in 2004 as opposed to the previous results. The new route runs through an area of open land in which there are no nearby receptors at present. Air quality objectives for SO<sub>2</sub> and PM<sub>10</sub> continued to be met.

An 'Air Quality Update and Screening Assessment' report was submitted in April 2006. This report concluded that there was no necessity to carry out a Detailed Assessment in respect of NO<sub>2</sub>, SO<sub>2</sub> or PM<sub>10</sub>.

A "Progress Report on Air Quality Management" was submitted in April 2007. A review and assessment of pollutants showed the air quality objectives for NO<sub>2</sub>, SO<sub>2</sub> and PM<sub>10</sub> continued to be met throughout the district of Magherafelt.

A "Local Air Quality Management Grant Evaluation Form" was submitted in April 2008. Results for site 1 showed a clear exceedence for NO<sub>2</sub> and therefore this department were advised to undertake a Detailed Assessment.

A "Progress Report on Air Quality Management" was submitted in August 2008. Due to the exceedence to the NO<sub>2</sub> standard set for site 1, it was the intention of this department to provide an additional tube in the vicinity of the nearest residential property for comparison purposes.

A "Local Air Quality Management Grant Evaluation Form" was submitted in April 2009. Results for previous years showed a clear exceedence at site 1 for NO<sub>2</sub> and so an additional tube (site 8) was provided in the vicinity of the nearest residential property for comparison purposes (from 4<sup>th</sup> September 2008). Results showed that levels of this pollutant met with standards set. Monitoring therefore ceased at site 1 as properties in the vicinity of this tube are now commercial or available for commercial use.

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An 'Air Quality Update and Screening Assessment' report was submitted in May 2009. This report concluded that there was a necessity to carry out a Detailed Assessment in respect of NO<sub>2</sub> at site 2.

A "Local Air Quality Management Grant Evaluation Form" and a "Progress Report on Air Quality Management" were submitted in July 2010. Additional sites were identified in the area surrounding site 2 in order to gain a comprehensive overview of the air quality standard in this area.

A "Detailed Assessment for NO<sub>2</sub> Levels on Church Street and King Street, Magherafelt" was submitted March 2011 (amended September 2011) to the Air and Environmental Quality Unit of the Department of the Environment. This concluded that there were exceedences at site 2, 9 and 10 with other locations in this vicinity close to the objective limit. A recommendation to declare an AQMA was made.

A "Local Air Quality Management Grant Evaluation Form" was submitted in May 2011. This highlighted that a Detailed Assessment had been submitted however the final outcome had not been decided.

A "Local Air Quality Management Grant Evaluation Form" was submitted in March 2012. This highlighted that an AQMA had been formally declared.

## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken**

#### **2.1.1 Automatic Monitoring Sites**

Not applicable to Magherafelt District Council.

#### **2.1.2 Non-Automatic Monitoring**

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**Table 2.1 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	Main route through town	X 8958 Y 9048	NO2	No	No	1m	No
Site 2	Main route through town	X 8977 Y 9073	NO2	No	Yes (1m)	1m	Yes
Site 3	Adjacent traffic lights at junction	X 8531 Y 0043	NO2	No	Yes (1m)	1m	Yes
Site 4	Off main road leading to cul-de-sac	X 8989 Y 9078	NO2	No	Yes (10m)	20m	No
Site 5	Roadside location in village	X 9251 Y 9318	NO2	No	Yes (0m)	1m	Yes
Site 6	Area formerly adjacent to main arterial route	X 9887 Y 9085	NO2	No	Yes (25m)	1m	Yes
Site 7	Moderately used route into town centre	X 8982 Y 9069	NO2	No	Yes (15m)	1.5m	Yes
Site 8	Nearest residential property to site 1	X 8960 Y 9046	NO2	No	Yes (0m)	10m	Yes
Site 9	Adjacent roundabout in town centre	X 8974 Y 9073	NO2	No	Yes (10m)	1.5m	No
Site10	Adjacent mini-roundabout off town centre	X 8979 Y 9074	NO2	No	Yes (0m)	1.5m	Yes
Site 11	Moderately used route into town centre	X 8979 Y 9071	NO2	No	Yes(15m)	1.5m	No
Site 12	Main route through town	X 8989 Y 9075	NO2	No	Yes(15m)	1.5m	No

QA:QC data can be found in Appendix 1.

## **2.2 Comparison of Monitoring Results with AQ Objectives**

### **2.2.1 Nitrogen Dioxide**

#### **Automatic Monitoring Data**

Not applicable to Magherafelt District Council.

#### **Diffusion Tube Monitoring Data**



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**Table 2.2a Results of Nitrogen Dioxide Diffusion Tubes 2011**

Site ID	Location	Within AQMA?	Data Capture 2011 %	Annual mean concentrations
				2011 ( $\mu\text{g}/\text{m}^3$ ) Adjusted for bias
1	Adjacent 36 Queen Street, Magherafelt	N/A	N/A	Decomissioned
2	Adjacent 22 Church Street, Magherafelt	Yes (declared 14/2/12)	100	47*
3	Adjacent 50 Main Street, Maghera	No	100	32
4	Wesleyan Mews, Magherafelt	Yes (declared 14/2/12)	100	19
5	Adjacent 15 Boyne Row, Castledawson	No	100	23
6	Adjacent 2 Bannside, Toomebridge	No	92	21
7	Adjacent 27 King Street, Magherafelt	Yes (declared 14/2/12)	100	24
8	42 Queen Street, Magherafelt	No	100	25
9	12 Church Street Magherafelt	Yes (declared 14/2/12)	100	38
10	30 Church Street Magherafelt	Yes (declared 14/2/12)	92	51*
11	11 King Street Magherafelt	Yes (declared 14/2/12)	100	30
12	Off-set from 41 Church Street, Magherafelt	Yes (declared 14/2/12)	100	31

\* Indicates exceedence identified

Analysis of the diffusion tubes was carried out by Gradko Environmental. An Air Quality Management Area has been declared in the District of Magherafelt on 14<sup>th</sup> February 2012 in respect of Church Street and lower King Street. This area has been shown on the map in Appendix 2. Monthly data for 2011 can be found in Appendix 3. Results are calculated based on the national database bias adjustment factor of 0.89 for Gradko Environmental.

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**Table 2.2b Results of Nitrogen Dioxide Diffusion Tubes 2007 - 2010**

Site ID	Location	Within AQMA?	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ ) Adjusted for bias				
			2006	2007	2008	2009	2010
1	Adjacent 36 Queen Street, Magherafelt	No	33	47	43	46	-
2	Adjacent 22 Church Street, Magherafelt	No	35	37	54	48	37
3	Adjacent 50 Main Street, Maghera	No	33	38	33	35	38
4	Wesleyan Mews, Magherafelt	No	17	18	20	21	18
5	Adjacent 15 Boyne Row, Castledawson	No	17	20	24	24	20
6	Adjacent 2 Bannside, Toomebridge	No	14	20	21	21	20
7	Adjacent 27 King Street, Magherafelt	No	19	22	25	24	22
8	42 Queen Street, Magherafelt		-	-	21	24	34
9	12 Church Street Magherafelt		-	-	-	46	54
10	30 Church Street Magherafelt		-	-	-	55	59
11	11 King Street Magherafelt		-	-	-	39	40
12	Off-set from 41 Church Street, Magherafelt		-	-	-	35	39

Analysis of the diffusion tubes in 2006 was carried out by Lambeth Scientific Services Ltd. In line with the approach adopted by NETCEN in their report dated May 2002, when it was reported that there was a high variability in laboratory bias, both positive and negative, no bias correction has been made on 2006 data.

Results for 2007 with the exception of site 6 are calculated based on the national databases bias adjustment factor of 1.056 for Lambeth Scientific Services Ltd. The result for site 6 is based on 7 months data and on the local study (Belfast) bias adjustment factor of 1.00.

Analysis of the diffusion tubes in 2008 was carried out by Gradko Environmental. Results for sites 1 - 7 are calculated based on the national database bias adjustment factor of 0.92 for Gradko

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Environmental. Site 8 is based on 4 months data and the local study (Belfast) bias adjustment factor of 0.79.

Analysis of the diffusion tubes in 2009 was carried out by Gradko Environmental. Results for site 1 are based on 6 months data and the local study (Belfast) bias adjustment factor of 0.87. Site 2 – 8 are calculated based on the national database bias adjustment factor of 0.9 for Gradko Environmental. Sites 9 – 12 are calculated based on 3 months data and the local study (Belfast) bias adjustment factor of 0.87.

Analysis of the diffusion tubes in 2010 was carried out by Gradko Environmental. Results are calculated based on the national database bias adjustment factor of 0.90.

### **2.2.2 PM<sub>10</sub>**

Not applicable to Magherafelt District Council, see section 1.4 of this report.

### **2.2.3 Sulphur Dioxide**

Not applicable to Magherafelt District Council, see section 1.4 of this report.

### **2.2.4 Benzene**

Not applicable to Magherafelt District Council, see section 1.4 of this report.

### **2.2.5 Other pollutants monitored**

Not applicable to Magherafelt District Council, see section 1.4 of this report.

### **3 Road Traffic Sources**

#### **3.1 Narrow Congested Streets with Residential Properties Close to the Kerb**

Magherafelt District Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

#### **3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic**

Magherafelt District Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

#### **3.3 Roads with a High Flow of Buses and/or HGVs.**

Magherafelt District Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

#### **3.4 Junctions and busy roads**

Magherafelt District Council confirms that there are no new/newly identified busy junctions/busy roads.

#### **3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment**

Magherafelt District Council confirms that there are no new/proposed roads.

#### **3.6 Roads with Significantly Changed Traffic Flows**

Magherafelt District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

### **3.7 Bus and Coach Stations**

Magherafelt District Council confirms that there are no relevant bus stations in the District.

## **4 Other Transport Sources**

### **4.1 Airports**

Magherafelt District Council confirms that there are no airports in the District.

### **4.2 Railways (Diesel and Steam Trains)**

#### **4.2.1 Stationary Trains**

Magherafelt District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

#### **4.2.2 Moving Trains**

Magherafelt District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

### **4.3 Ports (Shipping)**

Magherafelt District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

## **5 Industrial Sources**

### **5.1 Industrial Installations**

#### **5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out**

Magherafelt District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

#### **5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced**

Magherafelt District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

#### **5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment**

Magherafelt District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

### **5.2 Major Fuel (Petrol) Storage Depots**

There are no major fuel (petrol) storage depots within the Local Authority area.

### **5.3 Petrol Stations**

Magherafelt District Council confirms that there are no petrol stations meeting the specified criteria.

### **5.4 Poultry Farms**

Magherafelt District Council confirms that there are no poultry farms meeting the specified criteria.

## **6 Commercial and Domestic Sources**

### **6.1 Biomass Combustion – Individual Installations**

Magherafelt District Council confirms that there are no biomass combustion plant in the District.

### **6.2 Biomass Combustion – Combined Impacts**

Magherafelt District Council confirms that there are no biomass combustion plant in the District.

### **6.3 Domestic Solid-Fuel Burning**

Magherafelt District Council confirms that there are no areas of significant domestic fuel use in the District.



## **7 Fugitive or Uncontrolled Sources...**

Magherafelt District Council confirms that there are no potential sources of fugitive particulate matter emissions in the District which are not being adequately controlled.

## **8 Conclusions and Proposed Actions**

### **8.1 Conclusions from New Monitoring Data**

Recent routine monitoring of NO<sub>2</sub> levels in an area of Magherafelt town in part of Church Street and King Street have shown levels of exceedence of the standard set in Technical Guidance document LAQM.TG(09). A document entitled 'Detailed Assessment for NO<sub>2</sub> Levels on Church Street and King Street, Magherafelt September 2011' was submitted to DOENI with the conclusion that there was a breach of the objective limit of 40ug/m<sup>3</sup> in this location, and recommending that the council should declare an AQMA as required by legislation and the technical guidance.

The findings of the Detailed Assessment have been reviewed by the Air and Environmental Quality Unit of DOENI and the conclusions and recommendation accepted.

An Air Quality Management Area has been formally declared in the District of Magherafelt on 14<sup>th</sup> February 2012 in respect of Church Street and lower King Street. This area has been shown on the map in Appendix 2.

### **8.2 Conclusions from Assessment of Sources**

An Air Quality Management Area has been declared in the District of Magherafelt on 14<sup>th</sup> February 2012 in respect of Church Street and lower King Street. This area has been shown on the map in Appendix 2.

### **8.3 Proposed Actions**

Based on the declaration date an Action Plan is due to be submitted to DOENI by August 2013.

## **9 References**

- i. The Environment (Northern Ireland) Order 2002
- ii. Air Quality Regulations (Northern Ireland) 2003
- iii. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000
- iv. DEFRA Local Air Quality Management Technical Guidance LAQM.TG(09)
- v. Magherafelt District Council 1<sup>st</sup> Stage Review and Assessment of Air Quality 2001
- vi. Magherafelt District Council 2<sup>nd</sup> Stage Review and Assessment of Air Quality 2002
- vii. Magherafelt District Council Progress Report on Air Quality Management 2005
- viii. Magherafelt District Council Air Quality Update and Screening Assessment 2006
- ix. Magherafelt District Council Progress Report on Air Quality Management 2007
- x. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2008
- xi. Magherafelt District Council Progress Report on Air Quality Management 2008
- xii. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2009
- xiii. Magherafelt District Council Air Quality Update and Screening Assessment 2009
- xiv. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2010
- xv. Magherafelt District Council Progress Report on Air Quality Management 2010
- xvi. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2011
- xvii. Magherafelt District Council Detailed Assessment for NO<sub>2</sub> Levels on Church Street and King Street, Magherafelt 2011
- xviii. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2012

## **Appendices**

Appendix 1: QA/QC Data

Appendix 2 : Area designated as Air Quality Management Area

Appendix 3: Nitrogen dioxide diffusion tube monthly data for 2011

## **Appendix 1: QA:QC Data**

### **Diffusion Tube Bias Adjustment Factors**

Lambeth Scientific Services Ltd., Arlington Lodge, 26 Wanless Road, London, SE24 0HW supplied and analysed NO<sub>2</sub> diffusion tubes up until and including December 2007. Results for 2007 with the exception of site 6 are calculated based on the national database bias adjustment factor of 1.056 for Lambeth Scientific Services Ltd. The result for site 6 is based on 7 months data and on the local study (Belfast) bias adjustment factor of 1.00. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

NO<sub>2</sub> diffusion tubes from 2008 were supplied and analysed by Gradko Environmental, St. Martins House, 77 Wales Street, Winchester, Hampshire, SO23 0RH. The preparation method used was 20% Triethanolamine / Deionised Water.

2008 results for sites 1 - 7 are calculated based on the national database bias adjustment factor of 0.92 for Gradko Environmental. Site 8 is based on 4 months data and the local study (Belfast) bias adjustment factor of 0.79. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

2009 results for site 1 are based on 6 months data and the local study (Belfast) bias adjustment factor of 0.87. Site 2 – 8 are calculated based on the national database bias adjustment factor of 0.9 for Gradko Environmental. Sites 9 – 12 are calculated based on 3 months data and the local study (Belfast) bias adjustment factor of 0.87. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

2010 results are calculated based on the national database bias adjustment factor of 0.90. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

2011 results are calculated based on the national database bias adjustment factor of 0.89 for Gradko Environmental. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

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

Not applicable to Magherafelt District Council.

### **Discussion of Choice of Factor to Use**

Guidance on the most suitable bias adjustment factor to be applied was taken from Technical Guidance.

2011 results are calculated based 11 and 12 months data and on the national database bias adjustment factor of 0.89 for Gradko Environmental. Bias adjustment factors were obtained from the Air Quality Review and Assessment website

### **PM Monitoring Adjustment**

Not applicable to Magherafelt District Council, see section 1.4 of this report.

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

Short-term data obtained by Magherafelt District Council was not adjusted to long-term data.

### **QA/QC of automatic monitoring**

Not applicable to Magherafelt District Council.

**QA/QC of diffusion tube monitoring**

Gradko Environmental analytical laboratory is assessed annually by UKAS to establish conformance of the Laboratory Quality Procedures to the requirements of ISO/IEC 17025 Standard and have continually demonstrated a good performance in the WASP scheme for analysis of NO<sub>2</sub> diffusion tubes, operated by the Health and Safety Laboratory.

## Appendix 2: Area designated as Air Quality Management Area



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### **Appendix 3:**

#### **Nitrogen dioxide diffusion tube monthly data for 2011**



St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH  
tel.: 01962 860331 fax: 01962 841339 e-mail: diffusion@gradko.co.uk

## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY

**REPORT NUMBER** 43277  
**BOOKING IN REFERENCE No** E 0654  
**CUSTOMER** MAGHERAFELT DISTRICT COUNCIL  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN  
**DATE SAMPLES RECEIVED** 04/02/2011

Tube Number	Exposure Data			TOTAL		
	Date On	Date Off	Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{G NO}_2$
2	05/01/2011	02/02/2011	672.00	69.08	36.06	3.37
3	05/01/2011	02/02/2011	672.00	47.09	24.58	2.30
4	05/01/2011	02/02/2011	672.00	31.33	16.35	1.53
5	05/01/2011	02/02/2011	672.00	41.20	21.50	2.01
6	05/01/2011	02/02/2011	672.00	28.58	14.92	1.40
7	05/01/2011	02/02/2011	672.00	40.72	21.25	1.99
8	05/01/2011	02/02/2011	672.00	38.08	19.88	1.86
9	05/01/2011	02/02/2011	672.00	57.41	29.96	2.80
10	05/01/2011	02/02/2011	672.00	68.43	35.71	3.34
11	05/01/2011	02/02/2011	672.00	43.94	22.93	2.15
12	05/01/2011	02/02/2011	672.00	52.78	27.55	2.58
Lab Blank			672.00	0.35	0.18	0.017

**Comment: Results are not blank subtracted**

**The exposure times were incorrect by 24 hours.**

**Tubes 2 and 10 were diluted to read within method calibration range.**

**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.**

7.26% +/-

**Limit of Detection**

0.014 $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UVS03 Cecil

**Analyst Name**

A. Ratcliffe

**Date of Analysis**

09/02/2011

**Date of Report**

10/02/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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L. Gates, Laboratory Supervisor

## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY

**REPORT NUMBER** 43669  
**BOOKING IN REFERENCE No** E 1093  
**CUSTOMER** MAGHERAFELT DISTRICT COUNCIL  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN  
**DATE SAMPLES RECEIVED** 03/03/2011

Tube Number	Exposure Data			TOTAL		
	Date On	Date Off	Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{G NO}_2$
2	02/02/2011	02/03/2011	672.00	49.34	25.75	2.41
3	02/02/2011	02/03/2011	672.00	37.53	19.59	1.83
4	02/02/2011	02/03/2011	672.00	30.34	15.84	1.48
5	02/02/2011	02/03/2011	672.00	27.68	14.45	1.35
6	02/02/2011	02/03/2011	672.00	24.77	12.93	1.21
7	02/02/2011	02/03/2011	672.00	32.04	16.72	1.57
8	02/02/2011	02/03/2011	672.00	25.59	13.36	1.25
9	02/02/2011	02/03/2011	672.00	45.45	23.72	2.22
10	02/02/2011	02/03/2011	672.00	64.54	33.68	3.15
11	02/02/2011	02/03/2011	672.00	35.97	18.78	1.76
12	02/02/2011	02/03/2011	672.00	33.66	17.57	1.64

Lab Blank 672.00 0.39 0.20 0.019

**Comment: Results are not blank subtracted**

**Tube 10 was diluted to read within method calibration range.**

**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.**

7.8% +/-

**Limit of Detection**

0.017  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UVS04 Camspec M550

**Analyst Name**

P. Hunter

**Date of Analysis**

11/03/2011

**Date of Report**

11/03/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

Form LQF32 Issue 2

Report Number 43669

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L. Gates, Laboratory Supervisor

# **NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY**

**REPORT NUMBER** 44148  
**BOOKING IN REFERENCE No** E 1817  
**CUSTOMER** Magherafelt District Council  
 50 Ballyronan Road  
 Magherafelt, Co Londonderry BT45 6EN  
**DATE SAMPLES RECEIVED** 08/04/2011

Tube Number	Exposure Data			$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL
	Date On	Date Off	Time (hr.)			$\mu\text{G NO}_2$
2	02/03/2011	06/04/2011	840.00	54.90	28.66	3.35
3	02/03/2011	06/04/2011	840.00	36.82	19.22	2.25
5	02/03/2011	06/04/2011	840.00	28.27	14.76	1.73
6	02/03/2011	06/04/2011	840.00	22.88	11.94	1.40
7	02/03/2011	06/04/2011	840.00	28.42	14.83	1.74
8	02/03/2011	06/04/2011	840.00	28.50	14.88	1.74
9	02/03/2011	06/04/2011	840.00	53.20	27.77	3.25
10	02/03/2011	06/04/2011	840.00	59.82	31.22	3.65
11	02/03/2011	06/04/2011	840.00	36.81	19.21	2.25
12	02/03/2011	06/04/2011	840.00	35.87	18.72	2.19
Extra: A- 486662			840.00	26.42	13.79	1.61
Lab Blank			840.00	0.10	0.05	0.006

**Comment: Results are not blank subtracted**

**1 extra tube was received and same exposure time used.**  
**Tubes 2, 9 and 10 were diluted to read within method calibration range.**  
**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.** 7.8% +/- **Limit of Detection** 0.017 $\mu\text{gNO}_2$

**Tube Preparation : 20% TEA / Water** Analysed on UVS04 Camspec M550

**Analyst Name** P. Hunter

**Date of Analysis** 14/04/2011 **Date of Report** 15/04/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**



## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY

**REPORT NUMBER** 44499  
**BOOKING IN REFERENCE No** E 2412  
**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN  
**DATE SAMPLES RECEIVED** 12/05/2011

Tube Number	Exposure Data					TOTAL
	Date On	Date Off	Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{G NO}_2$
2	06/04/2011	11/05/2011	840.00	72.20	37.68	4.41
3	06/04/2011	11/05/2011	840.00	35.35	18.45	2.16
4	06/04/2011	11/05/2011	840.00	23.78	12.41	1.45
5	06/04/2011	11/05/2011	840.00	22.70	11.85	1.39
7	06/04/2011	11/05/2011	840.00	24.60	12.84	1.50
8	06/04/2011	11/05/2011	840.00	22.54	11.76	1.38
9	06/04/2011	11/05/2011	840.00	50.61	26.42	3.09
10	06/04/2011	11/05/2011	840.00	81.18	42.37	4.96
11	06/04/2011	11/05/2011	840.00	29.94	15.63	1.83
12	06/04/2011	11/05/2011	840.00	34.66	18.09	2.12
Lab Blank			840.00	0.33	0.17	0.020

**Comment: Results are not blank subtracted**

**Tubes 2, 9 and 10 were diluted to read within method calibration range.**

**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.**

7.3% +/-

**Limit of Detection**

0.014 $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UVS03 Cecil

**Analyst Name**

J. Samuel

**Date of Analysis**

12/05/2011

**Date of Report**

16/05/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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Report Number 44499

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Gradko International Ltd  
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Signed.....*L. Gates*.....  
L. Gates, Laboratory Supervisor

St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH  
tel.: 01962 860331 fax: 01962 841339 e-mail: diffusion@gradko.co.uk

**LABORATORY ANALYSIS REPORT**  
**NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY**

**REPORT NUMBER** 44941  
**BOOKING IN REFERENCE No** E 2785  
**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN  
**DATE SAMPLES RECEIVED** 06/06/2011

Tube Number	Exposure Data					TOTAL µG NO <sub>2</sub>
	Date On	Date Off	Time (hr.)	µg/m <sup>3</sup> *	ppb *	
2	11/05/2011	03/06/2011	552.00	46.44	24.24	1.86
3	11/05/2011	03/06/2011	552.00	37.46	19.55	1.50
4	11/05/2011	03/06/2011	552.00	15.90	8.30	0.64
5	11/05/2011	03/06/2011	552.00	19.84	10.36	0.80
6	11/05/2011	03/06/2011	552.00	22.76	11.88	0.91
7	11/05/2011	03/06/2011	552.00	25.77	13.45	1.03
8	11/05/2011	03/06/2011	552.00	22.71	11.85	0.91
9	11/05/2011	03/06/2011	552.00	42.80	22.34	1.72
10	11/05/2011	03/06/2011	552.00	54.99	28.70	2.21
11	11/05/2011	03/06/2011	552.00	28.84	15.05	1.16
12	11/05/2011	03/06/2011	552.00	35.74	18.66	1.43
Lab Blank			552.00	0.07	0.04	0.003

**Comment: Results are not blank subtracted**

**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.**

7.8% +/-

**Limit of Detection**

0.017 µgNO<sub>2</sub>

Tube Preparation : 20% TEA / Water

Analysed on UVS04 Camspec M550

**Analyst Name**

A. Jones

**Date of Analysis**

20/06/2011

**Date of Report**

20/06/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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L. Gates, Laboratory Supervisor



## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY

**REPORT NUMBER** 45274  
**BOOKING IN REFERENCE No** E 3250  
**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN  
**DATE SAMPLES RECEIVED** 01/07/2011

Tube Number	Exposure Data			TOTAL		
	Date On	Date Off	Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{G NO}_2$
2	03/06/2011	29/06/2011	624.00	57.37	29.94	2.60
3	03/06/2011	29/06/2011	624.00	36.29	18.94	1.65
4	03/06/2011	29/06/2011	624.00	16.23	8.47	0.74
5	03/06/2011	29/06/2011	624.00	27.05	14.12	1.23
6	03/06/2011	29/06/2011	624.00	22.42	11.70	1.02
7	03/06/2011	29/06/2011	624.00	25.93	13.53	1.18
8	03/06/2011	29/06/2011	624.00	51.82	27.04	2.35
9	03/06/2011	29/06/2011	624.00	25.62	13.37	1.16
10	03/06/2011	29/06/2011	624.00	59.67	31.14	2.71
11	03/06/2011	29/06/2011	624.00	34.07	17.78	1.55
12	03/06/2011	29/06/2011	624.00	37.82	19.74	1.72
Lab Blank			624.00	0.07	0.03	0.003

**Comment: Results are not blank subtracted**

**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.**

7.8% +/-

**Limit of Detection**

0.017  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UVS04 Camspec M550

**Analyst Name**

B. Gregory

**Date of Analysis**

12/07/2011

**Date of Report**

12/07/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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L. Gates, Laboratory Supervisor

## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY

**REPORT NUMBER** 45726

**BOOKING IN REFERENCE No** E 3926

**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN

**DATE SAMPLES RECEIVED** 01/07/2011

Tube Number	Exposure Data			$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{G NO}_2$
	Date On	Date Off	Time (hr.)			
2	29/06/2011	03/08/2011	840.00	55.72	29.08	3.40
3	29/06/2011	03/08/2011	840.00	28.26	14.75	1.73
4	29/06/2011	03/08/2011	840.00	6.99	3.65	0.43
5	29/06/2011	03/08/2011	840.00	20.28	10.58	1.24
6	29/06/2011	03/08/2011	840.00	16.48	8.60	1.01
7	29/06/2011	03/08/2011	840.00	18.57	9.69	1.13
8	29/06/2011	03/08/2011	840.00	20.80	10.86	1.27
9	29/06/2011	03/08/2011	840.00	38.79	20.24	2.37
11	29/06/2011	03/08/2011	840.00	24.01	12.53	1.47
Extra:						
12			840.00	27.63	14.42	1.69
Lab Blank			840.00	0.16	0.09	0.010

**Comment: Results are not blank subtracted**

**The exposure times were incorrect.**

**Tube 2 was diluted to read within method calibration range.**

**One extra tube was received and same exposure time used.**

**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.**

7.8% +/-

**Limit of Detection**

0.017  $\mu\text{gNO}_2$

**Tube Preparation : 20% TEA / Water**

Analysed on UVS04 Camspec M550

**Analyst Name**

B. Gregory

**Date of Analysis**

08/08/2011

**Date of Report**

09/08/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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L. Gates, Laboratory Supervisor



## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY

**REPORT NUMBER** 46185

**BOOKING IN REFERENCE No** E 4511

**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN

**DATE SAMPLES RECEIVED** 01/09/2011

Tube Number	Exposure Data			$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{G NO}_2$
	Date On	Date Off	Time (hr.)			
2	03/08/2011	31/08/2011	672.00	48.53	25.33	2.37
3	03/08/2011	31/08/2011	672.00	30.08	15.70	1.47
4	03/08/2011	31/08/2011	672.00	13.98	7.30	0.68
5	03/08/2011	31/08/2011	672.00	24.96	13.03	1.22
6	03/08/2011	31/08/2011	672.00	21.52	11.23	1.05
7	03/08/2011	31/08/2011	672.00	21.09	11.01	1.03
8	03/08/2011	31/08/2011	672.00	25.51	13.31	1.25
9	03/08/2011	31/08/2011	672.00	39.93	20.84	1.95
10	03/08/2011	31/08/2011	672.00	50.76	26.49	2.48
11	03/08/2011	31/08/2011	672.00	29.87	15.59	1.46
12	03/08/2011	31/08/2011	672.00	30.81	16.08	1.51
Lab Blank			672.00	0.20	0.11	0.010

**Comment: Results are not blank subtracted**  
**Results have been corrected to a temperature of 293K (20C)**

**Overall M.O.U.** 7.8% +/- **Limit of Detection** 0.017  $\mu\text{gNO}_2$   
**Tube Preparation :** 20% TEA / Water **Analysed on** UVS04 Camspec M550 **Analyst Name** B. Gregory

**Date of Analysis** 02/09/2011 **Date of Report** 08/09/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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Report Number 46185

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L. Gates, Laboratory Supervisor



## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

**REPORT NUMBER** 46703  
**BOOKING IN REFERENCE No** E 5071  
**DESPATCH NOTE No** SOR 006416

**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN

**DATE SAMPLES RECEIVED** 29/09/2011

Tube Number	Exposure Data						TOTAL
	Date On	Date Off	Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *		$\mu\text{G NO}_2$
2	31/08/2011	28/09/2011	672.00	43.61	22.76		2.13
3	31/08/2011	28/09/2011	672.00	31.74	16.56		1.55
4	31/08/2011	28/09/2011	672.00	21.07	11.00		1.03
5	31/08/2011	28/09/2011	672.00	21.33	11.13		1.04
6	31/08/2011	28/09/2011	672.00	23.30	12.16		1.14
7	31/08/2011	28/09/2011	672.00	24.49	12.78		1.20
8	31/08/2011	28/09/2011	672.00	22.91	11.96		1.12
9	31/08/2011	28/09/2011	672.00	44.02	22.98		2.15
10	31/08/2011	28/09/2011	672.00	43.57	22.74		2.13
11	31/08/2011	28/09/2011	672.00	35.22	18.38		1.72
12	31/08/2011	28/09/2011	672.00	32.27	16.84		1.58
Lab Blank			672.00	0.08	0.04		0.004

**Comment:** Results are not blank subtracted  
Results have been corrected to a temperature of 293K (20C)

**Overall M.O.U** 7.3% +/-

**Tube Preparation :** 20% TEA / Water

Analysed on UVS03 Cecll

**Analyst Signature**

**Limit of Detection** 0.014 $\mu\text{gNO}_2$

**Analyst Name** J. Samuel

**Date of Analysis** 10/10/2011

**Date of Report** 11/10/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

**REPORT OFFICIALLY CHECKED**

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Signed *L. Gates*  
L. Gates, Laboratory Supervisor

## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

**REPORT NUMBER** 47088  
**BOOKING IN REFERENCE No** E 5727  
**DESPATCH NOTE No** SOR 006416

**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN

**DATE SAMPLES RECEIVED** 02/11/2011

Tube Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{G NO}_2$
	Date On	Date Off				
2	28/09/2011	01/11/2011	816.00	49.07	25.61	2.91
3	28/09/2011	01/11/2011	816.00	36.35	18.97	2.16
4	28/09/2011	01/11/2011	816.00	19.76	10.31	1.17
5	28/09/2011	01/11/2011	816.00	32.44	16.93	1.92
6	28/09/2011	01/11/2011	816.00	25.43	13.27	1.51
7	28/09/2011	01/11/2011	816.00	24.25	12.65	1.44
8	28/09/2011	01/11/2011	816.00	21.25	11.09	1.26
9	28/09/2011	01/11/2011	816.00	39.69	20.72	2.35
10	28/09/2011	01/11/2011	816.00	51.93	27.11	3.08
11	28/09/2011	01/11/2011	816.00	34.36	17.94	2.04
12	28/09/2011	01/11/2011	816.00	34.16	17.83	2.03
Lab Blank			816.00	0.08	0.04	0.005

**Comment:** Results are not blank subtracted

**Tube 10 was diluted to read within method calibration range.**

Results have been corrected to a temperature of 293K (20C)

**Overall M.O.U** 7.3% +/-

**Tube Preparation :** 20% TEA / Water

**Analyst Signature**

Analysed on UVS03 Cecil

**Limit of Detection** 0.014 $\mu\text{gNO}_2$

**Analyst Name** J. Samuel

**Date of Analysis** 03/11/2011

**Date of Report** 04/11/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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Report Number 47088

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**REPORT OFFICIALLY CHECKED**

Gradko International Ltd  
This signature confirms the authenticity of these results  
Signed.....*L. Gates*.....  
L. Gates, Laboratory Supervisor



## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

**REPORT NUMBER** 47592  
**BOOKING IN REFERENCE No** E 6363  
**DESPATCH NOTE No** SOR 006416

**CUSTOMER** Magherafelt District Council  
50 Ballyronan Road  
Magherafelt, Co Londonderry BT45 6EN

**DATE SAMPLES RECEIVED** 01/12/2011

Tube Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{G NO}_2$
	Date On	Date Off				
2 656228	01/11/2011	30/11/2011	696.00	43.14	22.51	2.18
3 556002	01/11/2011	30/11/2011	696.00	35.78	18.68	1.81
4 656474	01/11/2011	30/11/2011	696.00	26.09	13.62	1.32
5 655786	01/11/2011	30/11/2011	696.00	26.02	13.58	1.32
6 655828	01/11/2011	30/11/2011	696.00	28.07	14.65	1.42
7 655747	01/11/2011	30/11/2011	696.00	30.36	15.85	1.54
8 656013	01/11/2011	30/11/2011	696.00	24.59	12.84	1.24
9 656528	01/11/2011	30/11/2011	696.00	34.52	18.01	1.75
10 655916	01/11/2011	30/11/2011	696.00	42.42	22.14	2.15
11 656349	01/11/2011	30/11/2011	696.00	31.87	16.63	1.61
12 655981	01/11/2011	30/11/2011	696.00	34.04	17.77	1.72
Lab Blank			696.00	0.22	0.11	0.011

**Comment:** Results are not blank subtracted

Results have been corrected to a temperature of 293K (20C)

**Overall M.O.U** 7.3% +/-

**Tube Preparation :** 20% TEA / Water Analysed on UVS03 Cecil

**Analyst Signature**

**Limit of Detection** 0.014 $\mu\text{gNO}_2$

**Analyst Name** J. Samuel

**Date of Analysis** 05/12/2011

**Date of Report** 06/12/2011

**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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Report Number 47592

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Signed.....  
L. Gates, Laboratory Supervisor

## LABORATORY ANALYSIS REPORT

### NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

REPORT NUMBER **F0264R**

BOOKING IN REFERENCE No **F0264**

DESPATCH NOTE No **SOR0006416**

CUSTOMER **Magherafelt District Council**

**50 Ballyronan Road**

**Magherafelt, Co Londonderry BT45 6EN**

DATE SAMPLES RECEIVED **06/01/2012**

Tube Number	Exposure Data			TOTAL			
	Date On	Date Off	Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{G NO}_2$	
542947 2	30/11/2011	05/01/2012	864.00	40.64	21.21	2.55	
542887 3	30/11/2011	05/01/2012	864.00	33.12	17.29	2.08	
543181 4	30/11/2011	05/01/2012	864.00	22.87	11.94	1.44	
543239 5	30/11/2011	05/01/2012	864.00	22.58	11.79	1.42	
543111 6	30/11/2011	05/01/2012	864.00	19.27	10.06	1.21	
543522 7	30/11/2011	05/01/2012	864.00	27.36	14.28	1.72	
543002 8	30/11/2011	05/01/2012	864.00	27.39	14.30	1.72	
542730 9	30/11/2011	05/01/2012	864.00	46.26	24.14	2.91	
543000 10	30/11/2011	05/01/2012	864.00	47.77	24.93	3.00	
543554 11	30/11/2011	05/01/2012	864.00	34.14	17.82	2.14	
542794 12	30/11/2011	05/01/2012	864.00	32.07	16.74	2.01	
Lab Blank			864.00	0.06	0.03	0.004	

**Comment: Results are not blank subtracted**  
**Results have been corrected to a temperature of 293 K (20°)**

Overall M.O.U 7.3% +/-

Tube Preparation : 20% TEA / Water

Analysed on UVS03 Cecil

Analyst Signature

Date of Analysis

09/01/2012

Limit of Detection 0.014  $\mu\text{gNO}_2$

Analyst Name J. Samuel

Date of Report 23/01/2012

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd.

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Report Number **F0264R**

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Signed.....  
L. Gates, Laboratory Supervisor