



Comhairle Ceantair  
**Lár Uladh**  
**Mid Ulster**  
District Council

# Mid Ulster District Council

## 2017 Air Quality Progress Report

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

**Date November 2017**

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## Executive Summary

Mid Ulster District Council undertakes non automatic monitoring for No<sub>2</sub> in a number of towns and villages across the District. There were previously a total of five AQMA's declared in the former Council areas of Dungannon and South Tyrone and in the former Council area of Magherafelt. Two of the AQMA's in the Dungannon District were revoked prior to the formation of Mid Ulster District Council.

An Air Quality Management Area (AQMA) was declared in the former Magherafelt District Council area in February 2012 at Church Street and lower King Street. Based on current monitoring data, concentrations within this area continues to exceed the objective limit of 40ug/m<sup>3</sup> for NO<sub>2</sub> and as a result the AQMA should remain.

Construction of the A31 Magherafelt by-pass has now been completed. The by-pass consists of a 5.9km single carriageway to the east of Magherafelt town. This Department is hopeful that the use of the by-pass will result in a reduction of NO<sub>2</sub> levels, enabling the AQMA to be revoked.

Diffusion Tube monitoring at 8 locations within the former Dungannon and South Tyrone Borough Council's area has demonstrated that there are 2 sites where NO<sub>2</sub> levels exceeded the objective limit of 40ug/m<sup>3</sup>; namely Newell Road, Dungannon and Charlemont Street in Moy. There are already Air Quality Management Areas in place for these 2 sites.

An updated Action Plan for the three Air Quality Management Areas within the Mid Ulster District Council area has recently been drawn up, and approved by the Council.

As was stated in the Progress Report in 2014 the Air Quality Management Areas at Church Street (Dungannon) and Stewartstown Road (Coalisland) had not breached the air quality objective for the previous three years. As a result these 2 AQMAs were revoked by Dungannon & South Tyrone Borough Council in November 2014.

Diffusion tube monitoring at 8 locations in the former Cookstown District Council area in Cookstown and Moneymore did not demonstrate any exceedences of the objective limit of 40ug/m<sup>3</sup>. Routine monitoring of the 8 locations in Cookstown and Moneymore will continue.

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# **1 Introduction**

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

Mid-Ulster District Council is a local authority that was established on 1 April 2015 as a part of Local Government re-organisation in Northern Ireland. It replaced the three former Councils of Cookstown, Dungannon and South Tyrone, and Magherafelt.

Mid Ulster District Council, as the name suggests, is located centrally within the province. It straddles the two counties of Tyrone and Derry/ Londonderry. The District runs from Swatragh in the north to Fivemiletown in the south and from the Sperrin Mountains in the west to the shores of Lough Neagh in the east. Mid Ulster is the seventh largest of the eleven new council districts.

The district covers an area of some 1714 km<sup>2</sup> and serves a population of over 141,000 people. One third of the Council's population lives in urban areas while two thirds inhabit rural areas. The District has the fastest population growth when compared with the other 10 Council areas. The population increased by 18.7% from 2001 to 2013 compared with the Northern Ireland average of 8.3%.

Mid Ulster's employment sector is concentrated in the manufacturing, engineering, construction and agri-food industries.

## **1.2 Purpose of Progress Report**

This report fulfils the requirements of the Local Air Quality Management (LAQM) 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.

For Local Authorities in Northern Ireland, Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

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

### **1.3 Air Quality Objectives**

The air quality objectives applicable to LAQM **in Northern Ireland** are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. 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).



**Table 1.1 – Air Quality Objectives included in Regulations for the purpose of LAQM in Northern Ireland**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
	3.25 µg/m <sup>3</sup>	Running annual mean	31.12.2010
1,3-butadiene	2.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m <sup>3</sup>	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m <sup>3</sup>	Annual mean	31.12.2004
	0.25 µg/m <sup>3</sup>	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m <sup>3</sup>	Annual mean	31.12.2005
Particulate matter (PM <sub>10</sub> ) (gravimetric)	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m <sup>3</sup>	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

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

The Updating and Screening Assessment submitted by Mid Ulster District Council for 2015 was the first Report submitted by the recently merged former Councils of Dungannon and South Tyrone Borough Council, Magherafelt District Council, and Cookstown District Council. The conclusions of this report were as follows.

### **Former Magherafelt District Council**

Routine monitoring of NO<sub>2</sub> levels in an area of Magherafelt town in part of Church Street and King Street showed levels of exceedence of the standard set in Technical Guidance document LAQM.TG(16). 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 maps in Figure 1.1.

Concentrations within the AQMA have continued to exceed the objective for NO<sub>2</sub> at sites 2, 9 & 10 and as a result it was felt the AQMA should remain. The concentration at site 20 exceeded the objective for NO<sub>2</sub> since monitoring commenced in 2013. All other concentrations outside of the AQMA are all below the objectives. As a result of historic results, monitoring at sites 5,6 & 8 ceased on 2<sup>nd</sup> April 2014.

### **Former Dungannon & South Tyrone Borough Council**

Monitoring at 10 locations within Dungannon and South Tyrone Borough Council's area demonstrated that there were **2** sites where NO<sub>2</sub> levels exceeded the objective limit of 40ug/m<sup>3</sup> ; Newell Road, Dungannon and Charlemont Street in Moy. Again these areas are identified in maps in Fig 1.1.

Air Quality Management Areas are already in place for these 2 sites. Action Plans for the existing AQMAs at Newell Road, Dungannon and Charlemont Street, Moy were submitted in January 2015. These were recently updated in a review of all the AQMA's within the District and an updated Action Plan covering all the AQMA's was approved by Mid Ulster Council in Dec 2017.

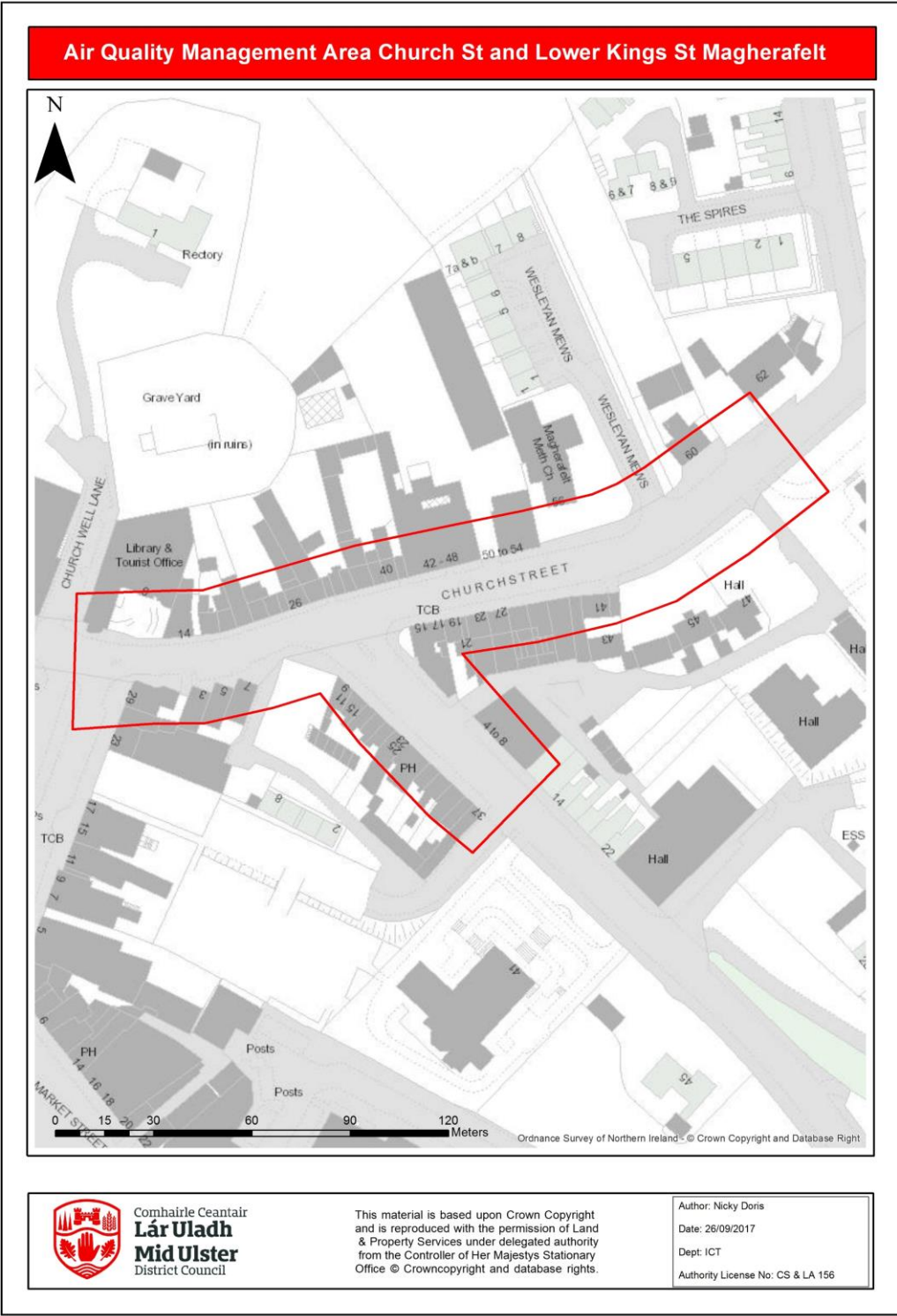
It was stated in the Progress Report in 2014 the Air Quality Management Areas at Church Street (Dungannon) and Stewartstown Road (Coalisland) had not breached the air quality objective in 3 consecutive years (2011, 2012, & 2013). These 2 AQMAs were revoked by Dungannon & South Tyrone Borough Council in November 2014.

No detailed assessments are required for NO<sub>2</sub> at this time.

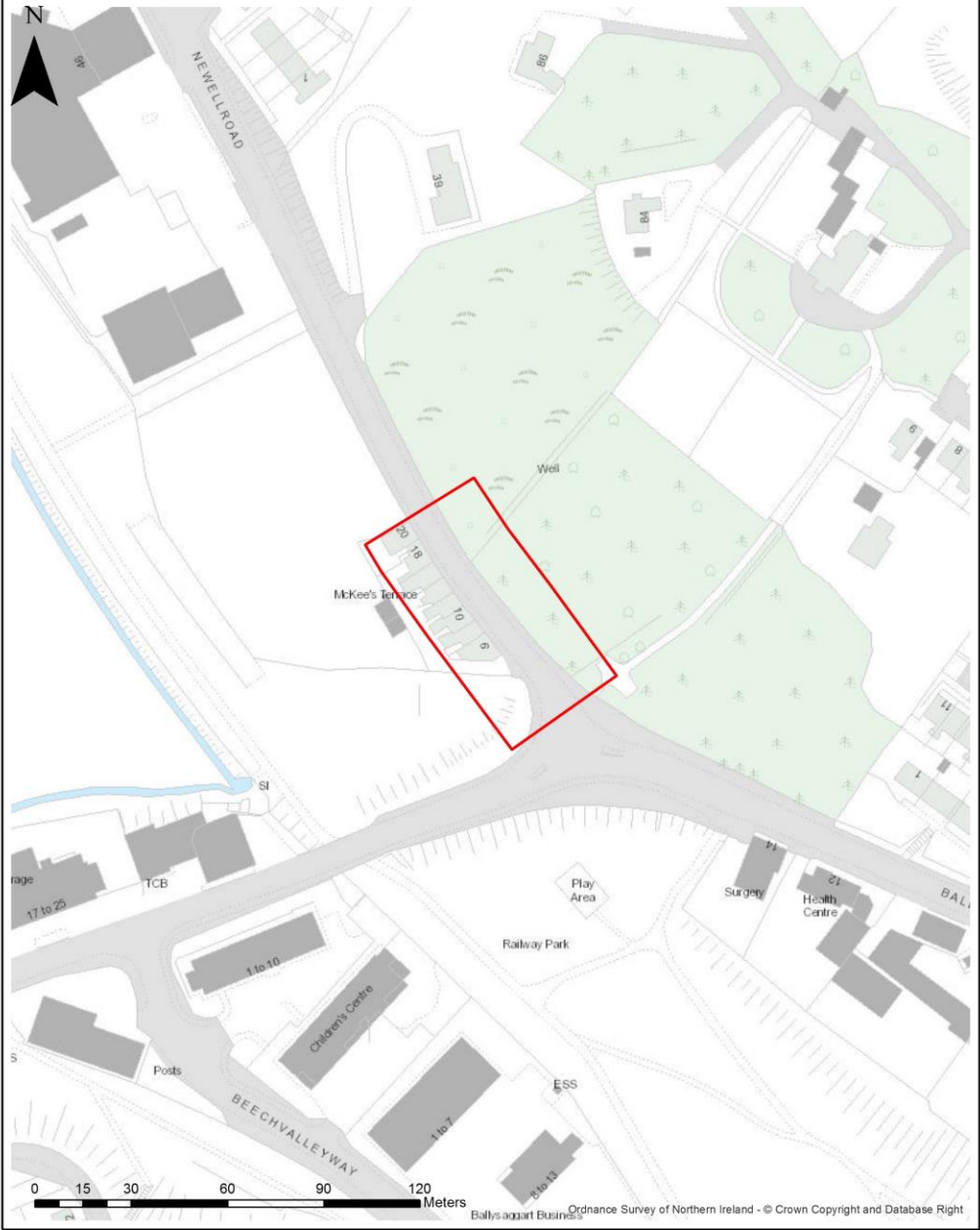
### **Former Cookstown District Council**


Cookstown District Council had no Air Quality Management Areas declared in the District. Air quality monitoring for NO<sub>2</sub> continues at a number of sites in the District in order to detect any trends in pollutant levels.

Figure 1.1 – Maps of AQMA Boundaries in Mid Ulster

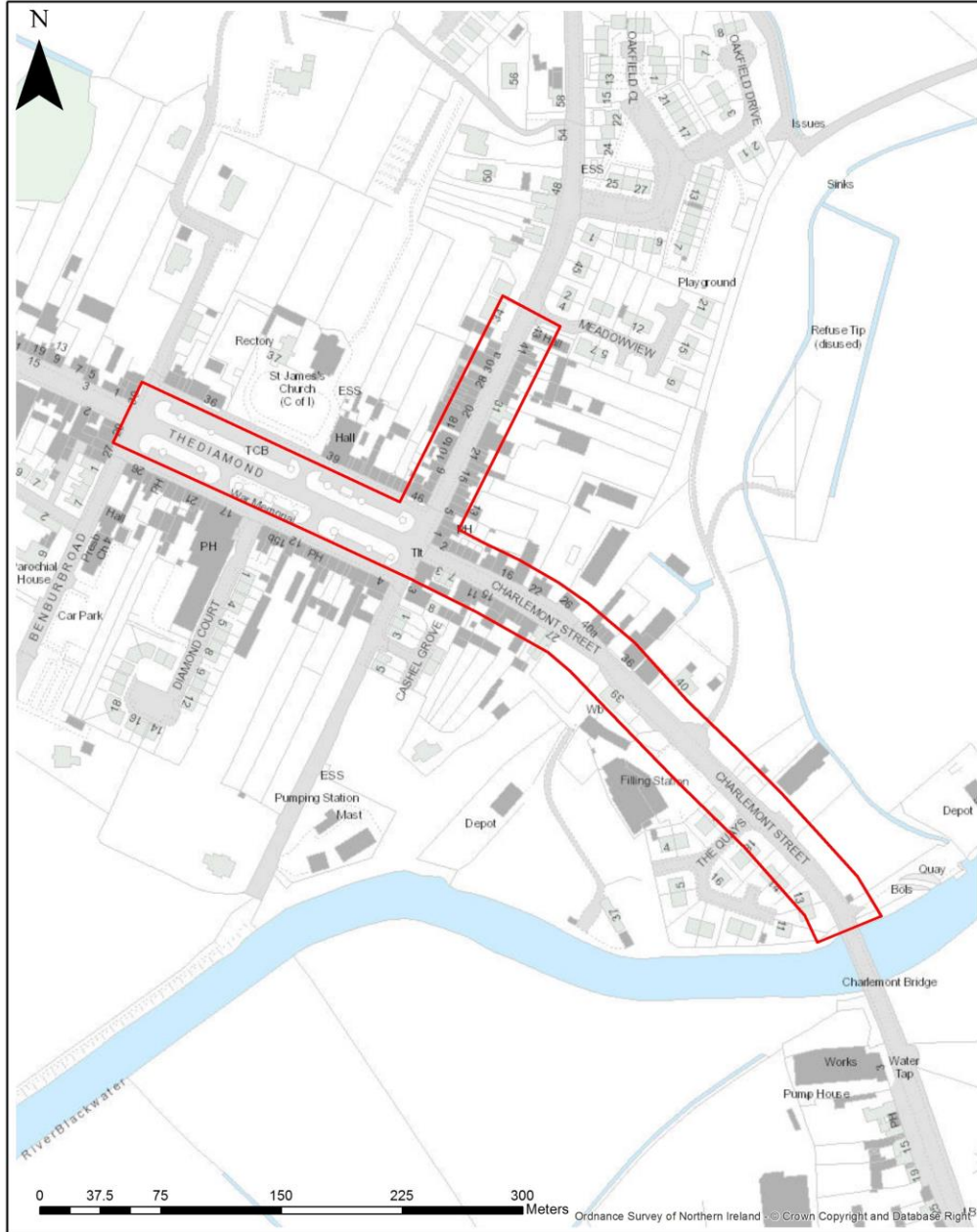


# Air Quality Management Area Newell Road Dungannon



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## Air Quality Management Area Charlemont St The Moy



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## **2 New Monitoring Data**

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

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

Mid Ulster District Council has no automatic monitoring data.

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

There are a number of non-automatic monitoring sites within the Mid Ulster District Council Area. These are located in Magherafelt, Moneymore, Cookstown, Dungannon, and Moy. These are summarised in Table 2.2 below.



**Table 2.2 – Details of Non- Automatic Monitoring Sites**

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Magherafelt											
M2	2	Roadside	8977	9073	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M3	3	Roadside	8531	9043	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M4	4	Roadside	8989	9078	2.5	NO <sub>2</sub>	N	N	Y	<5m	Y
M7	7	Roadside	8982	9069	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M9	9	Roadside	8974	9073	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M10	10	Roadside	8979	9074	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M11	11	Roadside	8979	9071	2.5	NO <sub>2</sub>	N	N	Y	<5m	Y
M12	12	Roadside	8989	9075	2.5	NO <sub>2</sub>	N	N	Y	<5m	Y
M13	13	Roadside	8989	9077	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M14	14	Roadside	8995	9083	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M15	15	Roadside	8994	9084	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M16	16	Roadside	8993	9089	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y

<b>Site ID</b>	<b>Site Name</b>	<b>Site Type</b>	<b>X OS Grid Reference</b>	<b>Y OS Grid Reference</b>	<b>Site Height (m)</b>	<b>Pollutants Monitored</b>	<b>In AQMA?</b>	<b>Is Monitoring Co-located with a Continuous Analyser (Y/N)</b>	<b>Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)</b>	<b>Distance to Kerb of Nearest Road (m) (N/A if not applicable)</b>	<b>Does this Location Represent Worst-Case Exposure?</b>
M17	17	Roadside	8997	9082	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M18	18	Roadside	8999	9085	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M19	19	Roadside	9003	9087	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M20	20	Roadside	9004	9089	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M21	21	Roadside	9008	9093	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y
M22	22	Roadside	9013	9097	2.5	NO <sub>2</sub>	Y	N	Y	<5m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Dungannon, Moy											
D1	Dunclare Way	Urban Background	279711	361478	2.5	NO <sub>2</sub>	N	N	Y (<10m)	>50m	Y
D2	Newell Road	Roadside	279135	362450	2.5	NO <sub>2</sub>	Y	N	Y(<1m)	2m	Y
D3	Ardgannon	Urban Background	279556	363019	2.5	NO <sub>2</sub>	N	N	Y(<1m)	>50m	Y
D4	The Quays Moy	Urban Background	285136	355932	2.5	NO <sub>2</sub>	N	N	Y (<10m)	>50m	Y
D5	Killyman St. Moy	Roadside	284993	356182	2.5	NO <sub>2</sub>	Y	N	Y(<1m)	3m	Y
D6	Charlemont St. Moy	Roadside	285009	356123	2.5	NO <sub>2</sub>	Y	N	Y(<1m)	2.5m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Cookstown, Moneymore											
2	William Street Cookstown	Roadside	281071	378445	2.5	NO <sub>2</sub>	N	N	Y(2m)	1	Y
3	James Street Cookstown	Kerbside	281053	378197	2.5	NO <sub>2</sub>	N	N	Y(4m)	2	Y
4	Church Street Cookstown	Roadside	281121	377537	2.5	NO <sub>2</sub>	N	N	Y(1m)	2	Y
5	Killymoon Street, Cookstown	Kerbside	281225	376939	2.5	NO <sub>2</sub>	N	N	Y(6m)	1	Y
1	Lawford St Moneymore	Kerbside	285770	383510	2.5	NO <sub>2</sub>	N	N	Y(1m)	2	Y
8	Smith Street Moneymore	Kerbside	285813	383458	2.5	NO <sub>2</sub>	N	N	Y(1m)	3	Y
10	Stonard Street Moneymore	Kerbside	285759	383333	2.5	NO <sub>2</sub>	N	N	Y(1m)	3	Y
11	Conyngham Street, Moneymore	Kerbside	285874	383341	2.5	NO <sub>2</sub>	N	N	Y(1m)	2	Y

## **2.2 Comparison of Monitoring Results with Air Quality Objectives**

### **2.2.1 Nitrogen Dioxide (NO<sub>2</sub>)**

#### **Automatic Monitoring Data**

There are no automatic monitoring sites within Mid Ulster District Council area  
diffusion Tube Monitoring Data

As can be seen from the Tables below there is four monitoring locations within Magherafelt, and one each within Dungannon and Moy that are in excess of the 40µg/m<sup>3</sup> annual mean NO<sub>2</sub> objective. All these sites are within designated AMQA areas. In addition the site at Charlemont Street, Moy showed a level of 61µg/m<sup>3</sup> That may indicate a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective.

There was no requirement to annualise any of the data collected as there was at least 75% data capture for each site.

The diffusion tubes used were supplied and analysed by Gradko Environmental of Hampshire, England. The results were adjusted for bias using figures obtained from the DEFRA Website under the Local Air Quality Management Section. The website lists the bias adjustment figures that should be applied to the diffusion tubes based on individual laboratories and the type of analysis undertaken. The overall 2016 figure for Gradko Laboratories and the 20% TEA method in water was 0.92. This is based on 32 studies. This was the figure used as it seemed most representative of the method in general.

The website can be found at the following address:

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

**Table 2.3 – Results of NO<sub>2</sub> Diffusion Tubes 2016**

<b>Site ID</b>	<b>Location</b>	<b>Site Type</b>	<b>Within AQMA?</b>	<b>Triplicate or Co-located Tube</b>	<b>Full Calendar Year Data Capture 2016 (Number of Months or %) <sup>a</sup></b>	<b>2016 Annual Mean Concentration (µg/m<sup>3</sup>) - Bias Adjustment factor = 0.92</b>
M2	22 Church St	Kerbside	Y	N	10	<b>47</b>
M3	50 Main St	Kerbside	N	N	12	34
M4	Wesleyan Mews	Off Road	Y	N	12	20
M7	27 King St	Kerbside	Y	N	12	25
M9	12 Church St	Kerbside	Y	N	12	<b>46</b>
M10	30 Church St	Kerbside	Y	N	10	<b>52</b>
M11	7 King St	Kerbside	Y	N	12	33
M12	41 Church St.	Kerbside	Y	N	12	32
M13	60 Church St	Kerbside	Y	N	12	28
M14	Corner Station Rd/ Church St	Kerbside	N	N	12	21
M15	The Spires	Kerbside	N	N	12	18
M16	14 Station Rd	Kerbside	N	N	11	18
M17	2 C'dawson Rd	Kerbside	N	N	12	31
M18	16 C'dawson Rd	Kerbside	N	N	12	36
M19	26 C'dawson Rd	Kerbside	N	N	12	36
M20	Opp St Mary's	Kerbside	Y	N	12	<b>43</b>
M21	St Mary's 2	Kerbside	N	N	12	36
M22	Brennan Court	Kerbside	N	N	12	24

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2016 (Number of Months or %) <sup>a</sup>	2016 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Bias Adjustment factor = 0.92
D1	Dunclose Way	Urban Background	N	N	12	9
D2	Newell Road	Roadside	Y	Triplicate	12	<b>58</b>
D3	Ardgannon	Urban Background	N	N	9	11
D4	The Quays, Moy	Urban Background	N	N	12	10
D5	Killyman Street, Moy	Roadside	N	Triplicate	12	29
D6	Charlemont Street, Moy	Roadside	Y	Triplicate	12	<b>61</b>
C2	William Street Cookstown	Kerbside	N	N	11	21
C3	James Street Cookstown	Roadside	N	N	10	32
C4	Church Street Cookstown	Kerbside	N	N	12	29
C5	Killymoon Street, Cookstown	Kerbside	N	N	11	32
C1	Lawford St Moneymore	Roadside	N	N	12	35
C8	Smith Street Moneymore	Kerbside	N	N	12	28
C10	Stonard Street Moneymore	Kerbside	N	N	12	34
C11	Conyngham Street, Moneymore	Kerbside	N	N	12	15

**In bold**, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40µg/m<sup>3</sup>

Underlined, annual mean > 60µg/m<sup>3</sup>, indicating a potential exceedence of the NO<sub>2</sub> hourly mean AQS objective

<sup>a</sup> Means should be “annualised” as in Boxes 7.9 and 7.10 of LAQM.TG16, if full calendar year data capture is less than 75%

<sup>b</sup> If an exceedence is measured at a monitoring site not representative of public exposure, NO<sub>2</sub> concentration at the nearest relevant exposure should be estimated based on the “[NO<sub>2</sub> fall-off with distance](http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html)” calculator (<http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>), and results should be discussed in a specific section. The procedure is also explained in paragraphs 7.77 to 7.79 of LAQM.TG16.



**Table 2.4 – Results of NO<sub>2</sub> Diffusion Tubes (2012 to 2016)**

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m <sup>3</sup> ) - Adjusted for Bias <sup>a</sup>				
			2012	2013	2014	2015	2016
M2	Kerbside	Y	<b>48</b>	<b>44</b>	<b>47</b>	37.7	<b>47</b>
M3	Kerbside	N	33	30	33	27.2	34
M4	Off Road	Y	19	19	20	17.6	20
M7	Kerbside	Y	23	23	24	20.8	25
M9	Kerbside	Y	<b>41</b>	<b>42</b>	<b>42</b>	37.6	<b>46</b>
M10	Kerbside	Y	<b>50</b>	<b>50</b>	<b>49</b>	<b>45.6</b>	<b>52</b>
M11	Kerbside	Y	30	29	30	28.8	33
M12	Kerbside	Y	32	33	30	27.2	32
M13	Kerbside	Y	N/A	25	26	23.2	28
M14	Kerbside	N	N/A	21	22	19.2	21
M15	Kerbside	N	N/A	19	20	16.0	18
M16	Kerbside	N	N/A	18	19	16.0	18
M17	Kerbside	N	N/A	29	31	27.2	31
M18	Kerbside	N	N/A	31	33	26.4	36
M19	Kerbside	N	N/A	34	32	27.2	36
M20	Kerbside	N	N/A	<b>41</b>	<b>42</b>	35.2	<b>43</b>
M21	Kerbside	N	N/A	37	38	31.2	36
M22	Kerbside	N	N/A	24	25	22.4	24

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m³) - Adjusted for Bias <sup>a</sup>				
			2012	2013	2014	2015	2016
D1	Urban Background	N	N/A	N/A	8	8	9
D2	Roadside	Y	<b>55</b>	<b>52</b>	<b>52</b>	<b>53</b>	<b>58</b>
D3	Urban Background	N	12	12	12	11	11
D4	Urban Background	N	N/A	N/A	8	8	10
D5	Roadside	N	N/A	N/A	25	23	29
D6	Roadside	Y	<b>56</b>	<b>56</b>	<b>55</b>	<b>58</b>	<b>61</b>
C2	Kerbside	N	35	31	34	28.8	21
C3	Roadside	N	23	23	25	20.4	32
C4	Kerbside	N	34	28	30	28.3	29
C5	Kerbside	N	28	23	26	22.4	32
C1	Roadside	N	32	29	33	29.1	35
C8	Kerbside	N	27	22	26	22.1	28
C10	Kerbside	N	34	32	31	21.5	34
C11	Kerbside	N	N/A	16	16	23.2	15
C10	Kerbside	N	34	32	31	21.5	34
C11	Kerbside	N	N/A	16	16	23.2	15

**In bold**, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40µg/m<sup>3</sup>

Underlined, annual mean > 60µg/m<sup>3</sup>, indicating a potential exceedence of the NO<sub>2</sub> hourly mean AQS objective

<sup>a</sup> Means should be “annualised” as in Boxes 7.9 and 7.10 of LAQM.TG16, if full calendar year data capture is less than 75%

### **2.2.2 Particulate Matter (PM<sub>10</sub>)**

Mid Ulster District Council does not monitor for PM10 within the district.

### **2.2.3 Sulphur Dioxide (SO<sub>2</sub>)**

Mid Ulster District Council does not monitor for Sulphur Dioxide within the district.

### **2.2.4 Benzene**

Mid Ulster District Council does not monitor for Benzene within the district.

### **2.2.5 Other Pollutants Monitored**

Mid Ulster District Council does not monitor for any other pollutants within the district.

### **2.2.6 Summary of Compliance with AQS Objectives**

Mid Ulster District Council has examined the results from monitoring in the district. Concentrations within the AQMA's still exceed the objective for NO<sub>2</sub> pollutant at the AQMA's and the AQMA's should remain.

Concentrations outside of the AQMA's are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment. A Draft Action Plan has been prepared for all of the AQMA's within the Mid Ulster District Council area that outlines measures which the Council will be taking in order to try reduce concentrations of NO<sub>2</sub>.

## **3 New Local Developments**

### **3.1 Road Traffic Sources**

Mid Ulster 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 Other Transport Sources**

Mid Ulster District Council confirms that there are no new/newly identified significant transport sources within its District.

### **3.3 Industrial Sources**

Mid Ulster 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.

### **3.4 Commercial and Domestic Sources**

Mid Ulster District Council confirms that there are no new significant commercial or domestic sources in the District

### **3.5 New Developments with Fugitive or Uncontrolled Sources**

Mid Ulster District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

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

Mid Ulster District Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

## **4      Local / Regional Air Quality Strategy**

Mid Ulster Councils strategy on Local and Regional Air Quality issues is further discussed in Sections 6, 7 and 8 of this report.

Mid Ulster Council continues to promote local and regional developments within air quality. The Mid Ulster District Council Website has been reconfigured to direct people to the Air Quality NI website and DAERA Air Pollution Reports are normally available for download at this location.

## 5 Planning Applications

The following applications were considered by Mid Ulster Council as part of the planning application process. The Environmental Health Service were consulted on these applications when potential air quality issues would have been considered as a part of the response.

Table 5.1 Housing Developments

LA09/2016/1162/F	29 Trewmount Road Killyman Dungannon and lands adjacent	Housing development adjacent to and South West of No. 31 Trewmount Road to include a total of 19 new homes - 14 semi detached houses, 1 bungalow and 4 detached dwellings
M/2015/0097/F	46 Tullyvar Road Aughnacloy	Housing development consisting of 40 units of detached ,semi detached, terrace, apartments, state road and foul water treatment plant.
LA09/2015/0391/F	92 Roughan Road (off Drumreagh Crescent) Newmills Dungannon	Proposed housing development consisting of 12 semi detached houses and 2 detached houses including estate roads and foul water treatment plant
LA09/2016/1231/F	Lands immediately North of Chestnut Grove Dungannon Road Aughnacloy	Housing Development consisting of 18 no Semi Detached Two Storey Dwellings and 4 no Two Storey Detached Dwellings
LA09/2016/1162/F	29 Trewmount Road Killyman Dungannon and lands adjacent	Housing development adjacent to and South West of No. 31 Trewmount Road to include a total of 19 new homes - 14 semi detached houses, 1 bungalow and 4 detached dwellings
LA09/2016/1165/F	Lands opposite 270 Killyman Road Killyman Dungannon	Proposed housing development comprising the replacement of previously approved two blocks of 4 apartments with 3 blocks of semi detached dwellings and exclusion of the previously approved right turning lane
LA09/2015/0849/F	50m North of 115 Shore Road Ballyronan Magherafelt	Proposed housing development comprising 20 2-storey dwellings

Table 5.2 Anaerobic Digestors

LA09/2016/1446/F	Lands approx. 365 m south east of no. 20 Blackpark Road and to the rear of Creagh Concrete Toomebridge	Proposed development of a 500 Kw Centralised Anaerobic Digestion (CAD) plant, Combined Heat and Power (CHP) plant, access (part of link road) and ancillary site works.
LA09/2016/0290/F	Land approx. 300m N.E. of 17 Annaghroe Road Caledon BT68 4UJ	Proposed retention of 500KW anaerobic digestion plant with tanks, concrete silage pits, CHP building and all associated site works including slurry storage lagoon
LA09/2016/1092/F	Lands 104m West of 20 Ballyloughan Road Moneymore Magherafelt	Proposed development of 500kW on farm anaerobic digestion (AD) plant. Combined heat and power plant (CHP) access

Table 5.3 Henhouses and Pig Fattening Units

H/2014/0399/F	Land off Cahore Road approx. 100m East of 11A Tonaght Road Draperstown	Proposed pig fattening shed with feed bin (to contain 900 pork pigs) (Supporting information received)
LA09/2016/1697/F	190m South of 29 Alderwood Road Tattanellan Fivemiletown	Erection of Free Range Poultry House with PV panels on roof for electricity generation, 2no feed bins, (to contain 16,000 free range egg laying hens)
LA09/2016/1574/F	40m NE of 45 Ballynagarve Road Magherafelt	Retention of existing cattle shed with slurry tank and extension to provide sheep/livestock shed
LA09/2016/1464/F	Adjacent to 64 Desertmartin Road Moneymore	Retention of Agriculture Shed
LA09/2016/1545/F	Lands approx. 210m SE of 17 Murnells Road Pomeroy	Poultry House and Manure Store (11,000 Birds)
LA09/2016/1369/F	Approx 180m North East of 60 Cavan Road Lederg Dungannon	Proposed Free Range Hen House (Max Capacity 16,000 birds) with 2 No meal bins and litter shed
LA09/2015/0981/F	Land approx. 250m S.W. of 43 Carricklongfield Road Carnteel Aughnacloy	Proposed free range poultry shed with 2 feed bins (Poultry shed to contain 16000 free range egg laying hens)
LA09/2016/1349/F	Land Approx. 150m North of 47 Kilmakardle Road Dungannon	Proposed 1 No. Additional free range poultry shed with 1No. feed bin (New shed to contain 7000 free range egg laying hens taking the total site capacity 36840 free range egg laying hens)
LA09/2016/1151/F	Lands approx. 250m N.E. of 29 Derrylattinee Road Dungannon	Proposed additional free range poultry shed with feed bin (poultry shed to contain 8000 free range egg laying hens giving a total site capacity 16000 free range egg laying



		hens)
LA09/2016/1246/F	Lands West of no. 53 Knockaleery Road Cookstown	Winning & Working of Minerals (Sand & Gravel deposit) with restoration to agricultural lands. (amended description)
LA09/2016/1164/F	Approx 170m N.W. of 29 Ballyvaddy Road Brantry Dungannon	Proposed 2No. poultry units to house a total of 32000 free range laying birds
LA09/2016/1053/F	Land approx. 150m SE of 42 Drumard Cross Road Dungannon	Free Range Poultry Shed with 2 no Feed Bins and a Standby Generator Building (Poultry shed to contain 16,000 free range egg laying hens)
LA09/2016/1094/F	Adjacent to 17 Annaghoboe Road Coalisland	Proposed agricultural cattle shed (Supporting info. for DAERA June 2017)
LA09/2016/1039/F	Lands adjacent to 41 Annaghilla Road Augher	Proposed free range poultry unit for 8000 free range hens.
LA09/2016/0924/F	Land approx. 225m N.E. of 29 Foygh Road Dungannon	Proposed free range poultry shed with 2 feed bins and a standby generator Building (poultry shed to contain 16000 free range egg laying hens)
LA09/2016/0843/F	Land approx. 85m NE of 117 Aghnagar Road Galbally	2no Free Range Poultry Sheds with 2no Feed Bins and a Standby Generator Building (each poultry shed to contain 6,000 free range egg laying hens giving a total site capacity of 12,000 free range egg laying hens)
LA09/2016/0472/F	230m SW of Dungannon Park Farm Dungannon	1 no calf rearing shed, 1 no calf growing shed and 1 no calf finishing shed, with with associated site works including farm yard
LA09/2016/0392/F	Approx 160m East of 26 Garlaw Road Clogher	Proposed free range poultry laying unit including 2 feed storage bins with generator store and reception hut and associated works (max No birds 16000)
LA09/2016/0288/F	Lands approx. 100m West of 8 New Line Road Cookstown	Proposed free range poultry shed with 1No. feed bin and a standby generator building (Poultry shed to contain 6000 free range egg laying hens)
LA09/2016/0330/F	Land approx. 100m North East of 16 Ballynian Lane Swatragh	Proposed 2No. broiler poultry sheds with 4no. feed bins, 2 no. gas tanks, a biomass boiler shed with fuel bin and an office, changing and standby generator building (to contain in total 74, 000 broilers) and 4 passing bays.

Table 5.4 Industrial Applications

LA09/2016/0942/F	Lands 150m South of 50 Killygarvan Road Cookstown	Proposed drying plant
LA09/2016/0751/F	NE and Adjacent to 1 Washingbay Road Springisland Industrial Estate Coalisland Dungannon	Engineering Workshop and Offices (Extended Phase 1 Assessment- Version 2)
LA09/2016/0908/F	Lands approximately 450m North of 49 Blackrock Road Cookstown	Removal of surface stockpiles of boulders within previous sand and gravel working to facilitate regarding and restoration in accordance with approval I/2010/0086/F
LA09/2016/1015/F	Reid Engineering Site lands at 51 and 55 Knockanroe Road Cookstown	Proposed reorganisation of general industrial site including the retention and extension of the existing metal fabrication shed, the construction of 2 No. sheds for spraying and storage of metal,
LA09/2016/1102/RM	Lands North of 23 Magherafelt Road and opposite 1-8 Rochview Terrace Moneymore	Erection of 2 class B2 light industrial units
LA09/2016/0470/F	111 Ballynakilly Road Coalisland	Retention of the change of use of existing industrial buildings from that of a Re-Cycling Storage Facility to a General Engineering
LA09/2016/1144/F	4m West of 134 Tamnamore Road Dungannon	Works to provide an additional light industrial unit and 3 additional storage units
LA09/2016/0410/F	Adjacent to 38 Aghnagar Road Ballygawley	Construction of a new 33/11KV substation including a switch house, transformer and open mesh
LA09/2016/1241/F	Northstone Materials 18 Carmean Lane Moneymore	Extension to Existing Quarry
LA09/2016/1293/F	6 Grange Road Cookstown	Extension to storage facilities and improvements to sight lines at the main entrance (Amended plans)
LA09/2016/1328/F	Granville Industrial Estate Pumping Station adjacent to 20 Granville Road Dungannon	Extension to existing wastewater pumping station, including 2no below ground storage tanks, concrete hardstanding, fencing and lighting
LA09/2016/1223/F	111 Ballynakilly Road Coalisland	Retention of 3 hard standing areas incidental to the use of the engineering workshop ie, storage provision, car parking, turning and circulation space
LA09/2016/0419/F	135m NE of 11 Derryvale Park Derry Road Coalisland	Retention of extension to existing workshop unit
LA09/2016/0072/F	106 Syerla Road Dungannon	Retention of Existing Industrial/Commercial Buildings (3,146m sq floor space in total)

		(Revised Access
LA09/2016/0419/F	135m NE of 11 Derryvale Park Derry Road Coalisland BT71 4NT	etention of extension to existing workshop unit
LA09/2016/0203/F	116 Deerpark road Toomebridge Co Antrim.	Extension to existing chassis shelter
LA09/2016/0364/F	Unit 1 Forest Park Industrial Estate Cavanakeeran Road Pomeroy Dungannon	Proposed extension to existing workshop to accommodate wood saw and log splitter and the erection of store for wood chip.
LA09/2016/0254/F	80m N/E of 30 Moydamlaght Road Draperstown	To develop a Micro-hydro electricity generating renewable energy system (34kw) on the Altalacky River on the outskirts of Draperstown

## 6 Air Quality Planning Policies

### 6.1 Public Health Context

Air pollution is associated with a number of adverse health impacts. The COMEAP, 2015 statement on the health effects of nitrogen dioxide (NO<sub>2</sub>) concluded that evidence associating NO<sub>2</sub> with health has strengthened in recent years. The evidence points to an increase in estimating the mortality effects associated with long-term average concentrations of NO<sub>2</sub>.

### Planning and Policy Context

**Regional Development Strategy 2035**, the revised Regional Development Strategy for the future development of Northern Ireland up until 2035 and it is the spatial strategy of the Northern Ireland Executive. The RDS provides an overarching strategic planning framework to facilitate and guide the public and private sectors.

Accordingly, the RDS influences the Programme for Government, the Investment Strategy for Northern Ireland (ISNI), Department and Councils' decisions and investments, and investment by the private sector.

Air Quality Strategic Guidance within the Regional Development Strategy will reduce air pollution from transport. This will include the need to adapt the existing transport network to facilitate the modal shift away from the car. The way existing transport is used needs to be looked at to favour modes of transport that allow reduction of Northern Ireland's carbon footprint.

**Strategy Planning Policy Statement for Northern Ireland** (Planning for Sustainable Development), sets out the Department's regional planning policies for securing the orderly and consistent development of land in Northern Ireland under the reformed two-tier planning system. The provisions of the SPPS must be taken into account in the preparation of Local Development Plans, and are also material to all decisions on individual planning applications and appeals.

Mitigating and Adapting to Climate Change. A central challenge in furthering sustainable development is mitigating and adapting to climate change, whilst improving air quality.

Improving Health and Well-Being, networks of green spaces, commonly referred to as green infrastructure, provide a wide range of environmental benefits (in both rural and urban areas) including flood water storage, urban cooling, improved air quality and habitats for wildlife.

Safeguarding Residential and Work Environs, there are a wide range of environment and amenity considerations, including air quality, which should be taken into account by planning authorities when proposing policies or managing development.

## 7 Local Transport Plans and Strategies

**Mid Ulster District Council Corporate Plan 2015-2019**, is the first Corporate Plan of the new Mid Ulster District Council. The document provides the overarching themes and priorities to promote the critical balance of economic growth of the local industry, deliver community needs whilst maintaining a sustainable environment. Theme 3: Sustaining our Environment aims to protect, preserve and enhance the local Environment which should be taken account of when delivering on through Council functions.

**Our Community Plan, 10 year plan for Mid Ulster**, aims to deliver a range of actions to improve local well-being and quality of life. The Health and Wellbeing of the citizens of Mid Ulster is a prominent feature within the plan and the vision for success for this is proposed through improved health and wellbeing, increased healthy life expectancy, reduction of preventable deaths and reduction in health inequalities. All of the strategic actions will incorporate the principles of sustainable environment, equality and highest standard of public service. Mid Ulster Council Community Plan highlights the need for growth without making significant contribution to global warming and climate change or negatively impacting on the health and well-being of communities therein.

Theme 2- Infrastructure, specifies that improving the quality of our environment is also important. This includes the protection and development of the diverse elements within it and this will be considered as part of its cross cutting principles. The aim of the theme will measure success on the improvement of air quality in the district. Also, Theme 4: Health and Well Being provides a clear responsibility for Council to assist with the growth of healthy communities, through the delivery of initiatives such as 'Health Towns and Villages'. Such initiatives enable people to live longer healthier lives, become more active in an environment where there is improving air quality.

**Draft Local Development Plan (LDP) 2030**, the first stage in drafting the area plan has been undertaken by Mid Ulster District Council. The LDP "Preferred Options Paper" has been published with a Sustainability Appraisal (SA) including a Strategic Environmental Assessment (SEA) Interim Report measuring the options against agreed economic, environmental and social objectives. In line with regional policy

and objectives, sustainable development is a key theme within these documents, and local air quality management is considered via the SA / SEA process.

## **8 Implementation of Action Plans**

The Action Plan that has been produced by Mid Ulster District Council outlines the actions that the Council will deliver between 2017-2023 in order to reduce concentrations of air pollutants and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to the Mid Ulster District Council area.

It has been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part III of the Environment Order (NI) 2002 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

This Plan will be reviewed biennially, at the latest and progress on measures set out within this Plan will be reported on annually within Mid Ulster District Council's Progress Report. This AQAP was prepared by the Environmental Health Service in support of the vision and values within the 4 Themed Priorities of the Council Corporate Plan. This AQAP was recently approved by Mid Ulster District Council Environmental Committee and ratified by Full Council.



**Table 9.1 – Action Plan Progress**

Measure No.	Measure	EU Category	EU Class	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Estimated Completion Date
1	Investigate potential for traffic control systems leading to and within AQMA	Traffic Management	UTC, Congestion management, traffic reduction	TransportNI	2018	2019	To be determined	To be determined and dependent on proposed changes	To be agreed
2	Ensure potential air quality issues are assessed with new developments before problems arise through consultation with the Planning Department	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	MUDC	2017	Immediate	Unable to determine	Development of appropriate response for planning consultations in line with up to date guidance	On going
3	Investigate the potential of requiring a number of electric charging points to be included in certain developments, through consultation with the Planning Department	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	MUDC	2017	2018	Increase in number of charging point	Development of appropriate response for planning consultations in line with up to date guidance	On going

Measure No.	Measure	EU Category	EU Class	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Estimated Completion Date
4	Prepare information leaflets on how to help improve air quality and reduce exposure	Promoting Travel Alternatives Transport and Planning Infrastructure	Promotion of cycling Promotion of walking School Travel & Workplace Travel Planning	MUDC DEARA	2017-2023	Ongoing	To be determined	Development of leaflets and information on Council website. Promotion campaigns and advertisements	Ongoing
5	Control of emissions from Part C processes	Environmental Permits	Air Quality Planning and Policy Guidance	MUDC	2017	Ongoing	Meet inspection target in line with DEARA requirements	Compliance with KPI	Ongoing
6	Investigation of air quality nuisance complaints, inclusion appropriate action to resolve the problem	No EU category/ classification	No EU category/ classification	MUDC	In place	Ongoing	85% of complaints to be responded to within 3 days	Compliance with KPI	Ongoing
7	Identify, map and promote use of electric vehicle recharging points within Council area.	Promoting Low Emission Transport	Other	MUDC Local Business/town Centre forum	2018	2018	Map produced and available on council website	Unable to determine	2018
8	Enforcement of the Clean Air Act with regards to industrial smoke	No EU category/ classification	No EU category/ classification	MUDC	2017	Ongoing	Unable to determine	Ongoing	Ongoing

Measure No.	Measure	EU Category	EU Class	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Estimated Completion Date
9	Encourage the installation and of new and bicycle stands at large supermarkets located in the District and will promote the use of existing bicycle stands	Promoting Travel Alternatives	Promotion of cycling	MUDC Local Business/town Centre forum	2019	2020	Increase in number of bike stands	Unable to determine	Ongoing
10	Install bicycle stands are available at all council buildings	Promoting Travel Alternatives	Promotion of cycling	MUDC	2019	2020	Increase in number of bike stands	Unable to determine	Ongoing
11	Investigate fleet improvements of Council owned vehicles	Vehicle Fleet Efficiency	Vehicle Retrofitting Programme	MUDC	Not yet determined	Not yet determined	Not yet determined	Not yet determined	Not yet determined
12	Annual engagement event to educate and raise awareness regarding air quality. Also to find joint working opportunities	Public Information	Promotion campaigns and advertisements	MUDC	2018-2023	Ongoing	To be determined	Development of leaflets and information on Council website.	Ongoing
13	Investigation potential for marked walking and routes within towns	Promoting Travel Alternatives	Promotion of walking	MUDC	2019	2020	Increase in number of walking routes within towns	Unable to determine	Ongoing

## **9 Conclusions and Proposed Actions**

### **9.1 Conclusions from New Monitoring Data**

There is no need to proceed to a detailed assessment based on this year's new monitoring data.

### **9.2 Conclusions relating to New Local Developments**

There are no significant conclusions to be drawn in relation to new developments.

### **9.3 Other Conclusions**

There are no other significant conclusions to be drawn from the new monitoring data.

### **9.4 Proposed Actions**

The new monitoring data has not identified the need to progress to a detailed assessment for any pollutant. The monitoring data has indicated that there are no changes required to the existing AQMA's within the District. This Council's next course of action is to proceed with the actions identified in the newly adopted Air Quality Action Plan, and to continue to monitor pollutants at their current locations and submit a Progress Report in 2018.

## 10 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

- xix. Magherafelt District Council Air Quality Update and Screening Assessment 2012
- xx. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2013
- xxi. Magherafelt District Council Air Quality Progress Report 2013
- xxii. Magherafelt District Council Air Quality Progress Report 2014
- xxiii. Cookstown District Council 1st Stage Review and Assessment - August 2001
- xxiv. Cookstown District Council 2nd/3rd Stage Review and Assessment Report- August 2004.
- xxv. Cookstown District Council – Updating and Screening Assessment – August 2006
- xxvi. Cookstown District Council – Updating and Screening Assessment – Aug 2009
- xxvii. Cookstown District Council – Updating and Screening Assessment – Aug 2012
- xxviii. Cookstown District Council Progress Report – 2007
- xxix. Cookstown District Council Progress Report – 2008
- xxx. Cookstown District Council Progress Report – 2010
- xxxi. Cookstown District Council Progress Report – 2011
- xxxii. Cookstown District Council Progress Report – 2013
- xxxiii. 2015 Mid Ulster District Council Updating and Screening Assessment
- xxxiv. 2016 Mid Ulster District Council Air Quality Progress Report

# Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Appendix B: Maps Showing Locations of Non Automatic Monitoring Sites in AQMA's in Mid Ulster .

Appendix C: Results from NO<sub>2</sub> Diffusion Tube Monitoring Within the Mid Ulster District Council Area.

## Appendix A: QA/QC Data

### Diffusion Tube Bias Adjustment Factors

The diffusion tube analysis for the Council in 2016 was carried out by Gradko International, Winchester, Hampshire, England. The tubes were exposed for a month at a time before being sent for laboratory analysis. The preparation method used was an absorbent of %20 TEA (Triethanolamine)/Water. Analysis was carried out by U.V. Spectrophotometry using a UVSO4 Camspec M550.

The results were adjusted for bias using figures obtained from the DEFRA Website. under the Local Air Quality Management Section. The website lists the bias adjustment figures that should be applied to the diffusion tubes based on individual laboratories and the type of analysis undertaken. The overall 2016 figure for Gradko Laboratories and the 20% TEA method in water was 0.92. This is based on 32 overall co-location studies. This was the figure used as it seemed most representative of the method in general.

The website can be found at the following address:

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

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

This factor is not available in the Mid Ulster District Council area.

### Discussion of Choice of Factor to Use

Given that no locally available relevant co-location studies were available it was decided to use the national overall lo-location figure of 0.92 as this was representative of 32 separate co-location studies and was thought to represent a good 'average' figure.



## **QA/QC of Diffusion Tube Monitoring**

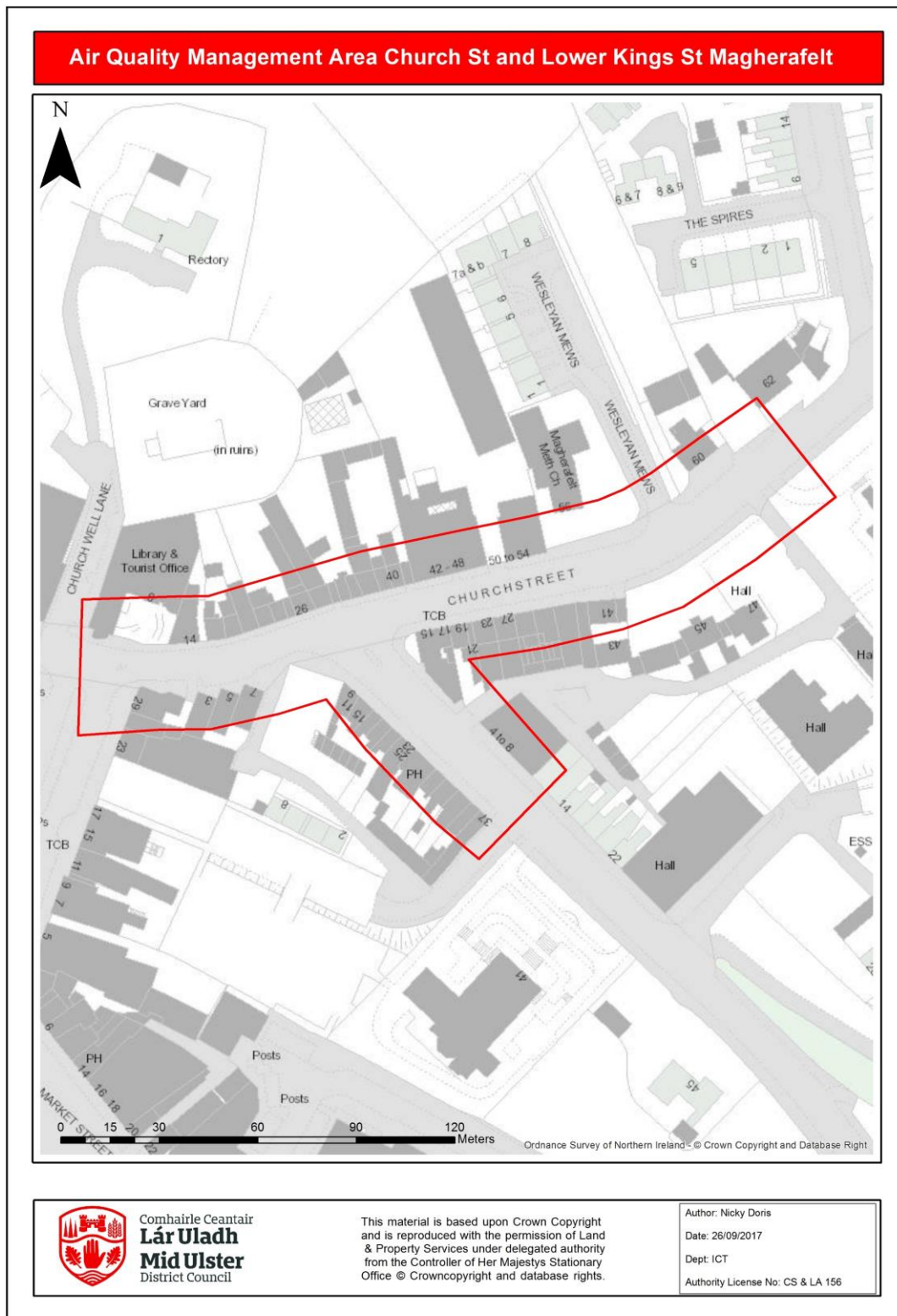
As discussed in the bias adjustment factor paragraph above the diffusion tube analysis was carried out by Gradko International, and the preparation method used was an absorbent of %20 TEA (Triethanolamine)/Water. Viewing the precision records for 2016 for this laboratory based on the 32 separate co-location studies showed that precision ranked as 'good' in 31 of the studies, and 'poor' in 1 of the studies. This would indicate that the laboratory has a 'good' precision record for this type of analysis.

<http://laqm.defra.gov.uk/diffusion-tubes/precision.html>

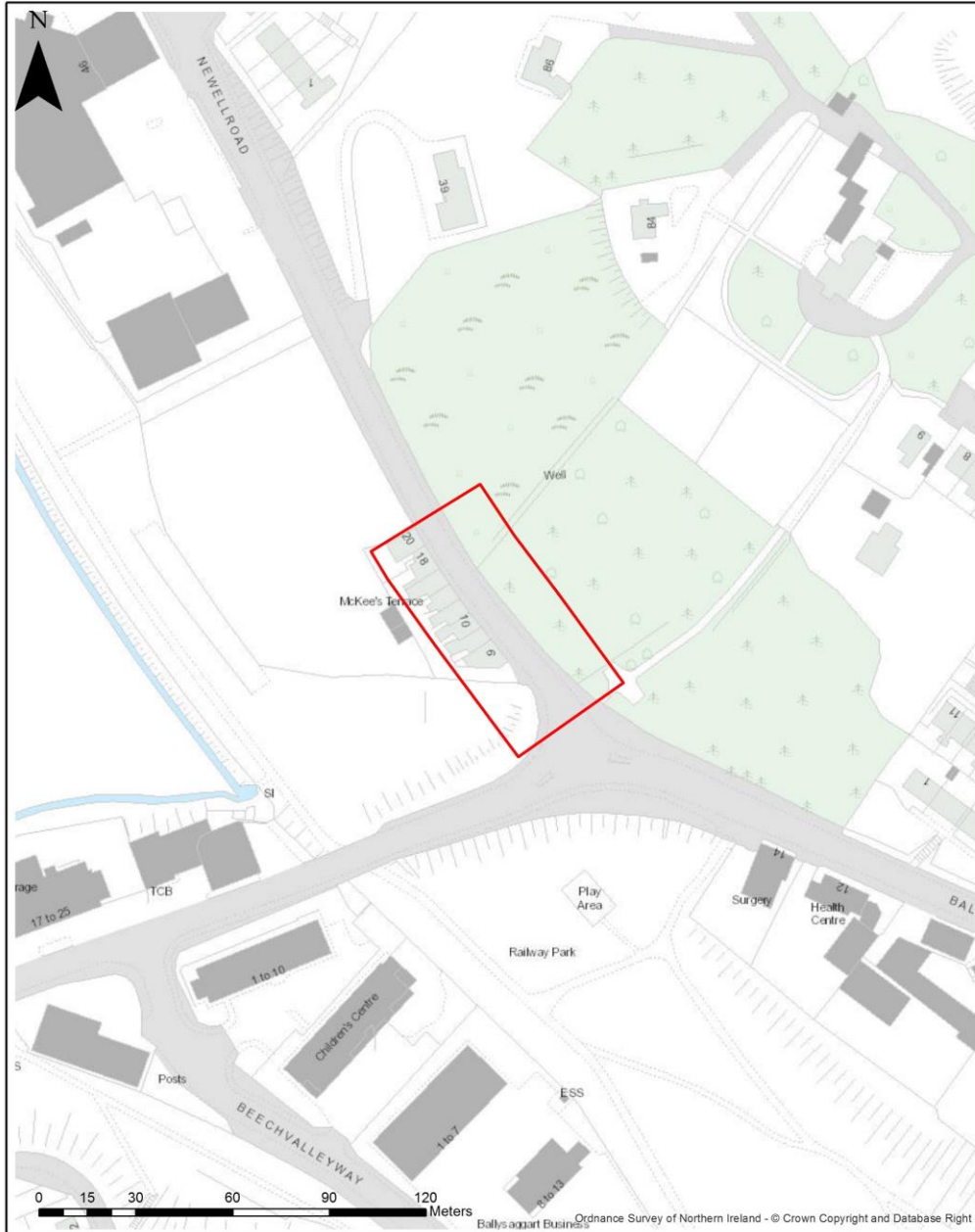
Laboratory summary performance for AIR NO<sub>2</sub> PT rounds AR007, 9, 10, 12, 13, 15, 16 and 18 between April 2015 and February 2017 showed that Gradko International scored 100% performance in all rounds again indicative of good WASP results..

<http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

## Appendix B: Non Automatic Monitoring Sites in AQMA's in Mid Ulster



## Air Quality Management Area Newell Road Dungannon

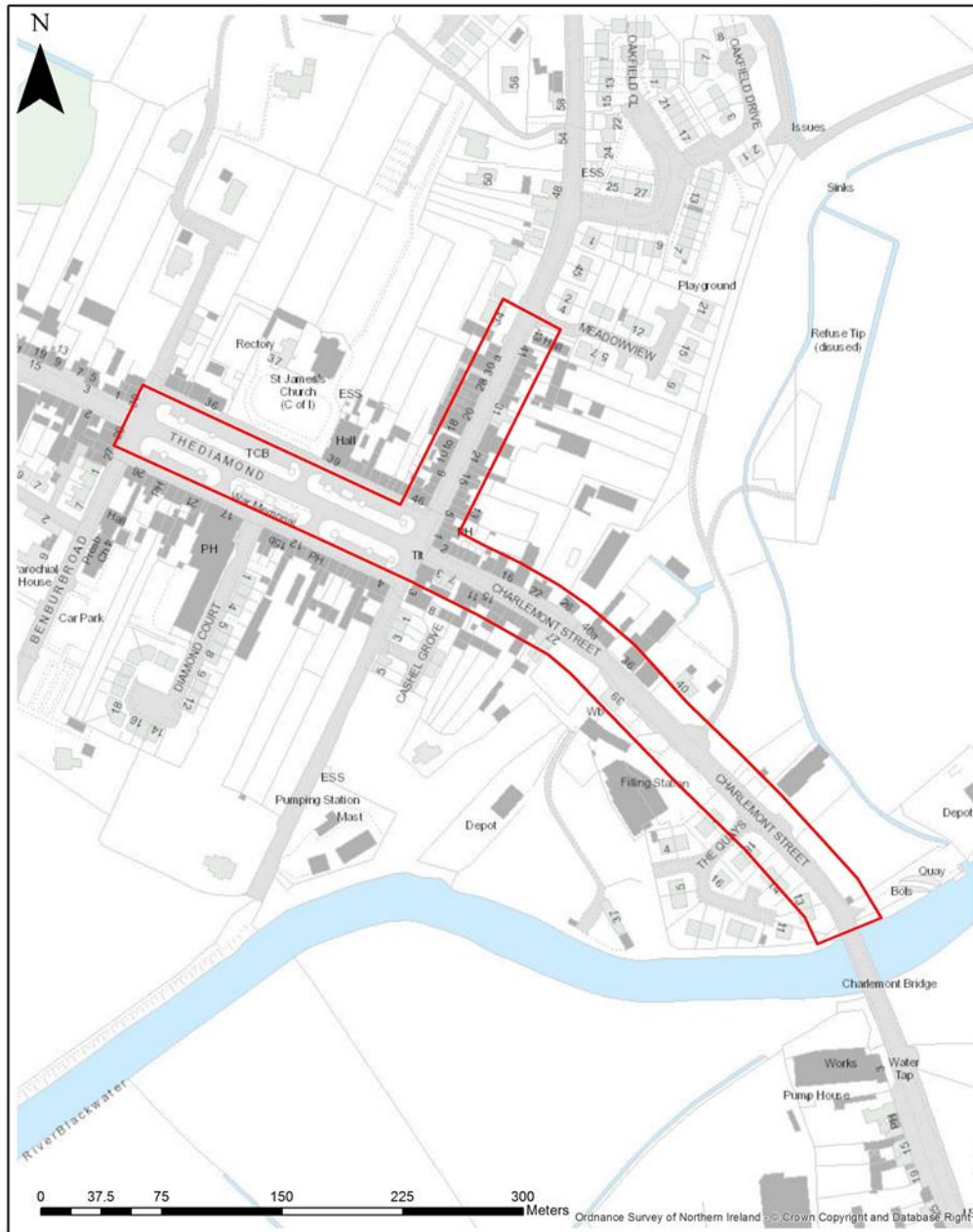


Comhairle Ceantair  
**Lár Uladh**  
**Mid Ulster**  
District Council

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## Air Quality Management Area Charlemont St The Moy



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Appendix C: Results from NO<sub>2</sub> Diffusion Tube Monitoring Within the Mid Ulster District Council Area.



(A division of Gradko International Ltd.)  
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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K00830R  
**BOOKING IN REFERENCE** K00830  
**DESPATCH NOTE** 24085  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 04/02/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
2	663685	06/01/2016	03/02/2016	672.00	46.27	24.15	2.26
3	663686	06/01/2016	03/02/2016	672.00	38.60	20.14	1.89
4	663687	06/01/2016	03/02/2016	672.00	25.08	13.09	1.23
7	663688	06/01/2016	03/02/2016	672.00	29.13	15.20	1.42
9	663689	06/01/2016	03/02/2016	672.00	38.92	20.31	1.90
10	663690	06/01/2016	03/02/2016	672.00	52.52	27.41	2.57
11	663691	06/01/2016	03/02/2016	672.00	37.29	19.46	1.82
12	663692	06/01/2016	03/02/2016	672.00	36.29	18.94	1.77
13	663693	06/01/2016	03/02/2016	672.00	33.73	17.60	1.65
14	663694	06/01/2016	03/02/2016	672.00	28.08	14.66	1.37
15	663695	06/01/2016	03/02/2016	672.00	24.16	12.61	1.18
17	663696	06/01/2016	03/02/2016	672.00	36.90	19.26	1.80
18	663697	06/01/2016	03/02/2016	672.00	36.54	19.07	1.78
19	663698	06/01/2016	03/02/2016	672.00	43.46	22.68	2.12
20	663699	06/01/2016	03/02/2016	672.00	53.77	28.06	2.63
21	663700	06/01/2016	03/02/2016	672.00	42.96	22.42	2.10
22	663701	06/01/2016	03/02/2016	672.00	31.52	16.45	1.54

Laboratory Blank 672.00 0.10 0.05 0.005

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

**Overall M.U.  $\pm 5.8\%$**   
**Tube Preparation : 20% TEA / Water**  
**Analysed on UV 08 Camspec M550**

**Limit of Detection** 0.010  $\mu\text{gNO}_2$   
**Analyst Name** Blazej Fiser

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number K00830R

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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K01472R

BOOKING IN REFERENCE K01472

DESPATCH NOTE 24086

CUSTOMER Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

DATE SAMPLES RECEIVED 04/03/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	TOTAL	
		Date On	Date Off			ppb *	$\mu\text{g NO}_2$
3	680048	03/02/2016	02/03/2016	672.00	45.46	23.73	2.22
4	680049	03/02/2016	02/03/2016	672.00	29.22	15.25	1.43
7	680050	03/02/2016	02/03/2016	672.00	31.75	16.57	1.55
9	680051	03/02/2016	02/03/2016	672.00	52.28	27.28	2.55
11	680052	03/02/2016	02/03/2016	672.00	45.63	23.82	2.23
12	680053	03/02/2016	02/03/2016	672.00	41.32	21.57	2.02
13	680054	03/02/2016	02/03/2016	672.00	33.48	17.47	1.64
14	680055	03/02/2016	02/03/2016	672.00	27.70	14.46	1.35
15	680056	03/02/2016	02/03/2016	672.00	22.97	11.99	1.12
16	680057	03/02/2016	02/03/2016	672.00	23.92	12.48	1.17
17	680058	03/02/2016	02/03/2016	672.00	40.41	21.09	1.97
18	680059	03/02/2016	02/03/2016	672.00	46.02	24.02	2.25
19	680060	03/02/2016	02/03/2016	672.00	49.11	25.63	2.40
20	680061	03/02/2016	02/03/2016	672.00	53.08	27.71	2.59
21	680062	03/02/2016	02/03/2016	672.00	44.82	23.39	2.19
22	680063	03/02/2016	02/03/2016	672.00	27.96	14.59	1.37
Laboratory Blank				672.00	0.18	0.10	0.009

Comment: Results are not blank subtracted

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

Overall M.U. 7.8% +/-

Limit of Detection 0.017 $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV 04 Camspec M550

Analyst Name Anna Paczosa

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K02142R  
**BOOKING IN REFERENCE** K02142  
**DESPATCH NOTE** 24087  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 04/04/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
3	092769	02/03/2016	01/04/2016	720.00	35.38	18.47	1.85
4	092770	02/03/2016	01/04/2016	720.00	21.89	11.43	1.15
7	092771	02/03/2016	01/04/2016	720.00	27.99	14.61	1.46
9	092772	02/03/2016	01/04/2016	720.00	49.45	25.81	2.59
11	092773	02/03/2016	01/04/2016	720.00	38.93	20.32	2.04
12	092774	02/03/2016	01/04/2016	720.00	32.17	16.79	1.68
13	092775	02/03/2016	01/04/2016	720.00	30.26	15.79	1.58
14	092776	02/03/2016	01/04/2016	720.00	21.63	11.29	1.13
15	092777	02/03/2016	01/04/2016	720.00	18.32	9.56	0.96
16	092778	02/03/2016	01/04/2016	720.00	21.37	11.15	1.12
17	092779	02/03/2016	01/04/2016	720.00	35.61	18.58	1.86
18	092780	02/03/2016	01/04/2016	720.00	39.80	20.77	2.08
19	092781	02/03/2016	01/04/2016	720.00	44.81	23.39	2.34
20	092782	02/03/2016	01/04/2016	720.00	47.94	25.02	2.51
21	092783	02/03/2016	01/04/2016	720.00	38.02	19.84	1.99
22	092784	02/03/2016	01/04/2016	720.00	23.36	12.19	1.22
Laboratory Blank				720.00	0.10	0.05	0.005

Comment: Results are not blank subtracted

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

Overall M.U. 5.2% +/-

Limit of Detection 0.010 $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV05 Camspec M550

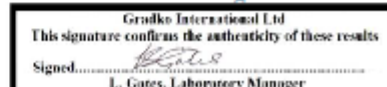
Analyst Name Chris Fraser

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K02605R  
**BOOKING IN REFERENCE** K02605  
**DESPATCH NOTE** 26539  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 28/04/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
2	708540	01/04/2016	27/04/2016	624.00	57.17	29.84	2.59
3	708541	01/04/2016	27/04/2016	624.00	30.17	15.74	1.37
4	708542	01/04/2016	27/04/2016	624.00	15.49	8.08	0.70
7	708543	01/04/2016	27/04/2016	624.00	24.09	12.57	1.09
9	708544	01/04/2016	27/04/2016	624.00	43.51	22.71	1.97
10	708545	01/04/2016	27/04/2016	624.00	60.57	31.61	2.75
11	708546	01/04/2016	27/04/2016	624.00	27.37	14.28	1.24
12	708547	01/04/2016	27/04/2016	624.00	28.38	14.81	1.29
13	708548	01/04/2016	27/04/2016	624.00	26.65	13.91	1.21
14	708549	01/04/2016	27/04/2016	624.00	17.54	9.15	0.80
15	708550	01/04/2016	27/04/2016	624.00	11.85	6.18	0.54
16	708551	01/04/2016	27/04/2016	624.00	15.61	8.15	0.71
17	708552	01/04/2016	27/04/2016	624.00	31.82	16.61	1.44
18	708553	01/04/2016	27/04/2016	624.00	39.33	20.52	1.78
19	708554	01/04/2016	27/04/2016	624.00	38.16	19.92	1.73
20	708555	01/04/2016	27/04/2016	624.00	45.29	23.64	2.05
21	708556	01/04/2016	27/04/2016	624.00	37.66	19.65	1.71
22	708557	01/04/2016	27/04/2016	624.00	20.10	10.49	0.91
Laboratory Blank				624.00	0.20	0.10	0.009

Comment: Results are not blank subtracted

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

Overall M.U. 5.2% +/-

Limit of Detection 0.010 $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV05 Camspec M550

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K03367R  
**BOOKING IN REFERENCE** K03367  
**DESPATCH NOTE** 29425  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN  
**DATE SAMPLES RECEIVED** 31/05/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
22	726483	27/04/2016	26/05/2016	696.00	22.99	12.00	1.16
21	726494	27/04/2016	26/05/2016	696.00	43.74	22.83	2.21
20	726495	27/04/2016	26/05/2016	696.00	54.96	28.69	2.78
19	726496	27/04/2016	26/05/2016	696.00	49.53	25.85	2.51
18	726497	27/04/2016	26/05/2016	696.00	43.11	22.50	2.18
17	726498	27/04/2016	26/05/2016	696.00	31.04	16.20	1.57
16	726499	27/04/2016	26/05/2016	696.00	14.55	7.59	0.74
15	726500	27/04/2016	26/05/2016	696.00	17.83	9.31	0.90
14	726501	27/04/2016	26/05/2016	696.00	20.11	10.50	1.02
13	726502	27/04/2016	26/05/2016	696.00	27.05	14.12	1.37
12	726503	27/04/2016	26/05/2016	696.00	36.30	18.94	1.84
11	726504	27/04/2016	26/05/2016	696.00	28.75	15.01	1.45
10	726505 **	27/04/2016	26/05/2016	696.00	71.67	37.40	3.63
9	726506	27/04/2016	26/05/2016	696.00	52.08	27.18	2.63
7	726507	27/04/2016	26/05/2016	696.00	24.26	12.66	1.23
4	726508	27/04/2016	26/05/2016	696.00	16.38	8.55	0.83
3	726509	27/04/2016	26/05/2016	696.00	34.04	17.77	1.72
2	726510	27/04/2016	26/05/2016	696.00	57.98	30.26	2.93
Laboratory Blank				696.00	0.10	0.05	0.005

Comment: Results are not blank subtracted

Tube 726493 contained a spider. Results may be compromised.

Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.

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

Overall M.U. 5.2% +/- Limit of Detection 0.010  $\mu\text{gNO}_2$

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Signed: L. Gates, Laboratory Manager

## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K03903R  
BOOKING IN REFERENCE K03903  
DESPATCH NOTE 29426  
CUSTOMER Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN  
DATE SAMPLES RECEIVED 30/06/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
2	741524 **	26/05/2016	29/06/2016	816.00	54.39	28.39	3.23
3	741525	26/05/2016	29/06/2016	816.00	31.12	16.24	1.85
4	741526	26/05/2016	29/06/2016	816.00	18.85	9.84	1.12
7	741527	26/05/2016	29/06/2016	816.00	24.04	12.55	1.43
9	741528	26/05/2016	29/06/2016	816.00	44.14	23.04	2.62
10	741529 **	26/05/2016	29/06/2016	816.00	58.32	30.44	3.46
11	741530	26/05/2016	29/06/2016	816.00	28.33	14.79	1.68
12	741531	26/05/2016	29/06/2016	816.00	27.04	14.11	1.60
13	741532	26/05/2016	29/06/2016	816.00	23.19	12.10	1.38
14	741533	26/05/2016	29/06/2016	816.00	14.70	7.67	0.87
15	741534	26/05/2016	29/06/2016	816.00	16.31	8.51	0.97
16	741535	26/05/2016	29/06/2016	816.00	15.00	7.83	0.89
17	741536	26/05/2016	29/06/2016	816.00	27.92	14.57	1.66
18	741537	26/05/2016	29/06/2016	816.00	36.54	19.07	2.17
19	741538	26/05/2016	29/06/2016	816.00	37.09	19.36	2.20
20	741539	26/05/2016	29/06/2016	816.00	42.77	22.32	2.54
21	741540	26/05/2016	29/06/2016	816.00	34.36	17.93	2.04
22	741541	26/05/2016	29/06/2016	816.00	24.67	12.88	1.46
Laboratory Blank				816.00	0.17	0.09	0.010

Comment: Results are not blank subtracted

Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.

Tubes 741526, 741533, 741536, 741538 & 741539 each contained a spider. Results may be compromised.

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

Overall M.U.

5.2% +/-

Limit of Detection

0.010 $\mu\text{gNO}_2$


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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K04655R

BOOKING IN REFERENCE K04655

DESPATCH NOTE 29426

CUSTOMER Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN

DATE SAMPLES RECEIVED 28/07/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	TOTAL	
		Date On	Date Off			ppb *	$\mu\text{g NO}_2$
2	756685	29/08/2016	27/07/2016	672.00	38.01	19.84	1.86
3	756686	29/08/2016	27/07/2016	672.00	33.19	17.32	1.62
4	756687	29/08/2016	27/07/2016	672.00	16.12	8.41	0.79
7	756688	29/08/2016	27/07/2016	672.00	22.61	11.80	1.10
9	756689	29/08/2016	27/07/2016	672.00	39.16	20.44	1.91
10	756690	29/08/2016	27/07/2016	672.00	45.99	24.00	2.25
11	756691	29/08/2016	27/07/2016	672.00	31.04	16.20	1.52
12	756692	29/08/2016	27/07/2016	672.00	31.31	16.34	1.53
13	756693	29/08/2016	27/07/2016	672.00	23.11	12.06	1.13
14	756694	29/08/2016	27/07/2016	672.00	16.85	8.79	0.82
15	756695	29/08/2016	27/07/2016	672.00	15.35	8.01	0.75
16	756696	29/08/2016	27/07/2016	672.00	12.58	6.57	0.61
17	756697	29/08/2016	27/07/2016	672.00	24.05	12.55	1.17
18	756698	29/08/2016	27/07/2016	672.00	35.47	18.51	1.73
19	756701	29/08/2016	27/07/2016	672.00	32.10	16.75	1.57
20	756702	29/08/2016	27/07/2016	672.00	40.74	21.26	1.99
21	756703	29/08/2016	27/07/2016	672.00	37.39	19.52	1.83
22	756704	29/08/2016	27/07/2016	672.00	25.46	13.29	1.24
Laboratory Blank				672.00	0.25	0.13	0.012

Comment: Results are not blank subtracted

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

Overall M.U. 5.2% +/-

Limit of Detection 0.010  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV05 Camspec M550

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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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** K05330R  
**BOOKING IN REFERENCE** K05330  
**DESPATCH NOTE** 29427  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 25/08/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
2	770816	27/07/2016	24/08/2016	672.00	50.21	26.20	2.45
3	770817	27/07/2016	24/08/2016	672.00	31.15	16.26	1.52
4	770818	27/07/2016	24/08/2016	672.00	15.54	8.11	0.76
7	770819	27/07/2016	24/08/2016	672.00	23.29	12.15	1.14
9	770820	27/07/2016	24/08/2016	672.00	38.16	19.92	1.86
10	770821	27/07/2016	24/08/2016	672.00	46.51	24.28	2.27
11	770822	27/07/2016	24/08/2016	672.00	26.91	14.04	1.31
12	770823	27/07/2016	24/08/2016	672.00	28.50	14.88	1.39
13	770824	27/07/2016	24/08/2016	672.00	23.66	12.35	1.16
14	770825	27/07/2016	24/08/2016	672.00	15.82	8.26	0.77
15	770826	27/07/2016	24/08/2016	672.00	14.84	7.75	0.72
16	770827	27/07/2016	24/08/2016	672.00	14.42	7.52	0.70
17	770828	27/07/2016	24/08/2016	672.00	25.00	13.05	1.22
18	770829	27/07/2016	24/08/2016	672.00	29.37	15.33	1.43
19	770830	27/07/2016	24/08/2016	672.00	30.26	15.79	1.48
20	770831	27/07/2016	24/08/2016	672.00	35.50	18.53	1.73
21	770814	27/07/2016	24/08/2016	672.00	32.38	16.90	1.58
22	770815	27/07/2016	24/08/2016	672.00	24.00	12.53	1.17
Laboratory Blank				672.00	0.14	0.07	0.007

**Comment:** Results are not blank subtracted

**Tube 770825 contained a spider and nest. Results may be compromised.**

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

**Overall M.U.** 7.8% +/-

**Limit of Detection** 0.017 $\mu\text{gNO}_2$

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

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number K05330R

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L. Gates, Laboratory Manager





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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K06066R  
**BOOKING IN REFERENCE** K06066  
**DESPATCH NOTE** 29429  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 29/09/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
2	785483	24/08/2016	28/09/2016	840.00	46.31	24.17	2.83
3	785484	24/08/2016	28/09/2016	840.00	30.37	15.85	1.85
4	785485	24/08/2016	28/09/2016	840.00	31.53	16.46	1.92
7	785486	24/08/2016	28/09/2016	840.00	26.20	13.68	1.60
9	785487	24/08/2016	28/09/2016	840.00	40.89	21.34	2.50
10	785488	24/08/2016	28/09/2016	840.00	48.76	25.45	2.98
11	785489	24/08/2016	28/09/2016	840.00	48.76	25.45	2.98
12	785490	24/08/2016	28/09/2016	840.00	32.19	16.80	1.97
13	785491	24/08/2016	28/09/2016	840.00	31.50	16.44	1.92
14	785492	24/08/2016	28/09/2016	840.00	22.94	11.97	1.40
15	785493	24/08/2016	28/09/2016	840.00	21.86	11.41	1.33
16	785494	24/08/2016	28/09/2016	840.00	19.65	10.26	1.20
17	785495	24/08/2016	28/09/2016	840.00	35.07	18.30	2.14
18	785496	24/08/2016	28/09/2016	840.00	36.07	18.83	2.20
19	785497	24/08/2016	28/09/2016	840.00	31.32	16.34	1.91
20	785498	24/08/2016	28/09/2016	840.00	45.08	23.53	2.75
21	785499	24/08/2016	28/09/2016	840.00	39.80	20.77	2.43
22	785500	24/08/2016	28/09/2016	840.00	27.53	14.37	1.68
Laboratory Blank				840.00	0.05	0.03	0.003

**Comment:** Results are not blank subtracted

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

**Overall M.U.** 5.2% +/-

**Limit of Detection** 0.010 $\mu\text{gNO}_2$

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

**Analysed on** UV05 Camspec M550

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K06878R  
BOOKING IN REFERENCE K06878  
DESPATCH NOTE 29430  
CUSTOMER Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN

DATE SAMPLES  
RECEIVED 31/10/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	TOTAL	
		Date On	Date Off			ppb *	$\mu\text{g NO}_2$
2	800674	28/09/2016	27/10/2016	696.00	47.78	24.94	2.42
3	800675	28/09/2016	27/10/2016	696.00	37.02	19.32	1.87
4	800676	28/09/2016	27/10/2016	696.00	21.60	11.28	1.09
7	800677	28/09/2016	27/10/2016	696.00	25.31	13.21	1.28
9	800678	28/09/2016	27/10/2016	696.00	50.91	26.57	2.58
10	800679	28/09/2016	27/10/2016	696.00	45.16	23.57	2.28
11	800680	28/09/2016	27/10/2016	696.00	31.34	16.35	1.59
13	800681	28/09/2016	27/10/2016	696.00	28.71	14.99	1.45
14	800682	28/09/2016	27/10/2016	696.00	26.34	13.75	1.33
15	800683	28/09/2016	27/10/2016	696.00	23.16	12.09	1.17
16	800684	28/09/2016	27/10/2016	696.00	22.92	11.96	1.16
17	800685	28/09/2016	27/10/2016	696.00	32.14	16.77	1.63
18	800686	28/09/2016	27/10/2016	696.00	31.51	16.45	1.59
19	800687	28/09/2016	27/10/2016	696.00	27.91	14.57	1.41
20	800688	28/09/2016	27/10/2016	696.00	36.23	18.91	1.83
21	800689	28/09/2016	27/10/2016	696.00	34.94	18.24	1.77
22	800700	28/09/2016	27/10/2016	696.00	27.99	14.61	1.42

Laboratory Blank 696.00 0.08 0.04 0.004

Comment: Results are not blank subtracted

Tube 800697 contained an insect. Results may be compromised.

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

Overall M.U. 5.2% +/- Limit of Detection 0.010 $\mu\text{gNO}_2$

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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## LABORATORY ANALYSIS REPORT

### COLORIMETRIC ANALYSIS OF NITROGEN DIOXIDE DIFFUSION TUBES

**REPORT NUMBER** K07688R  
**BOOKING IN REFERENCE** K07688  
**DESPATCH NOTE** 29431  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 05/12/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
2	817931	27/10/2016	30/11/2016	816.00	60.04	31.34	3.56
3	817932	27/10/2016	30/11/2016	816.00	51.17	26.71	3.04
4	817933	27/10/2016	30/11/2016	816.00	24.50	12.79	1.45
7	817934	27/10/2016	30/11/2016	816.00	37.87	19.77	2.25
9	817935	27/10/2016	30/11/2016	816.00	62.79	32.77	3.72
10	817936	27/10/2016	30/11/2016	816.00	89.87	46.91	5.33
11	817937	27/10/2016	30/11/2016	816.00	44.95	23.46	2.67
12	817938	27/10/2016	30/11/2016	816.00	47.21	24.64	2.80
13	817939	27/10/2016	30/11/2016	816.00	41.73	21.78	2.48
14	817940	27/10/2016	30/11/2016	816.00	30.23	15.78	1.79
15	817941	27/10/2016	30/11/2016	816.00	12.68	6.62	0.75
16	817942	27/10/2016	30/11/2016	816.00	27.62	14.42	1.64
17	817943	27/10/2016	30/11/2016	816.00	45.12	23.55	2.68
18	817944	27/10/2016	30/11/2016	816.00	52.88	27.60	3.14
19	817945	27/10/2016	30/11/2016	816.00	49.57	25.87	2.94
20	817946	27/10/2016	30/11/2016	816.00	64.97	33.91	3.85
21	817947	27/10/2016	30/11/2016	816.00	46.77	24.41	2.77
22	817948	27/10/2016	30/11/2016	816.00	30.84	16.10	1.83
Laboratory Blank				816.00	0.29	0.15	0.017

**Comment:** Results are not blank subtracted

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

**Overall M.U.**  $\pm 3.82\%$

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

**Analyst Name** Jess Crow

**Limit of Detection** 0.020  $\mu\text{g NO}_2$

**Report Checked By** Adam Robinson

**Date of Analysis** 15/12/2016

**Date of Report** 15/12/2016


Analysis carried out in accordance with documented in-house Laboratory Method GLM9 - QuAAtro Analyser

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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Report Number K07688R

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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER L00278R

BOOKING IN REFERENCE L00278

DESPATCH NOTE 29432

CUSTOMER Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN

DATE SAMPLES RECEIVED 06/01/2017

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
2	832492**	30/11/2016	04/01/2017	840.00	54.59	28.49	3.33
3	832493	30/11/2016	04/01/2017	840.00	42.54	22.21	2.60
4	832494	30/11/2016	04/01/2017	840.00	28.74	15.00	1.75
7	832495	30/11/2016	04/01/2017	840.00	31.33	16.35	1.91
9	832496**	30/11/2016	04/01/2017	840.00	83.51	43.58	5.10
10	832497	30/11/2016	04/01/2017	840.00	49.19	25.67	3.00
11	832498	30/11/2016	04/01/2017	840.00	40.42	21.10	2.47
12	832499	30/11/2016	04/01/2017	840.00	39.39	20.56	2.40
13	832500	30/11/2016	04/01/2017	840.00	36.46	19.03	2.23
14	832501	30/11/2016	04/01/2017	840.00	31.34	16.36	1.91
15	832502	30/11/2016	04/01/2017	840.00	30.97	16.16	1.89
16	832503	30/11/2016	04/01/2017	840.00	27.72	14.47	1.69
17	832504	30/11/2016	04/01/2017	840.00	36.67	19.14	2.24
18	832505	30/11/2016	04/01/2017	840.00	37.43	19.54	2.29
19	832506	30/11/2016	04/01/2017	840.00	37.23	19.43	2.27
20	832507	30/11/2016	04/01/2017	840.00	45.03	23.50	2.75
21	832508	30/11/2016	04/01/2017	840.00	40.82	21.31	2.49
22	832509	30/11/2016	04/01/2017	840.00	30.56	15.95	1.87
Laboratory Blank				840.00	0.16	0.09	0.010

Comment: Results are not blank subtracted

Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.

Tube 832496 was damaged (cracked). Results may be compromised.

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

Overall M.U.  $\pm 7.8\%$

Limit of Detection 0.010  $\mu\text{gNO}_2$

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K02812R

BOOKING IN REFERENCE K02812

DESPATCH NOTE 29424

CUSTOMER Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

DATE SAMPLES RECEIVED 06/05/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Ardgannon	712656	01/04/2016	27/04/2016	623.00	8.74	4.56	0.40
Newell Road 1	712683	01/04/2016	27/04/2016	622.75	56.59	29.54	2.56
Newell Road 2	712684	01/04/2016	27/04/2016	622.75	61.33	32.01	2.78
Newell Road 3	712685	01/04/2016	27/04/2016	622.75	64.67	33.75	2.93
Charlemont St, May 1	712670	01/04/2016	27/04/2016	621.00	59.32	30.96	2.68
Charlemont St, May 2	712671	01/04/2016	27/04/2016	621.00	62.01	32.36	2.80
Charlemont St, May 3	712672	01/04/2016	27/04/2016	621.00	62.45	32.59	2.82
Killymon St, May 1	712675	01/04/2016	27/04/2016	620.75	27.21	14.20	1.23
Killymon St, May 2	712674	01/04/2016	27/04/2016	620.75	26.99	14.08	1.22
Killymon St, May 3	712673	01/04/2016	27/04/2016	620.75	27.81	14.52	1.25
The Quays, May 1	712669	01/04/2016	27/04/2016	620.75	10.33	5.39	0.47
The Quays, May 2	712668	01/04/2016	27/04/2016	620.75	9.28	4.84	0.42
The Quays, May 3	712667	01/04/2016	27/04/2016	620.75	10.78	5.62	0.49
Dundose Way	712657	01/04/2016	27/04/2016	621.75	8.03	4.19	0.36
Laboratory Blank				623.00	0.13	0.07	0.006

Comment: Results are not blank subtracted

Tubes 712657 contained spiders. Results may be compromised.

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

Overall M.U. 7.8% +/-

Tube Preparation : 20% TEA / Water

Analysed on UV 04 Camspec M550

Limit of Detection 0.017  $\mu\text{gNO}_2$

Analyst Name Blazej Fiser

Date of Analysis 11/05/2016

Date of Report 11/05/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number K02812R

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K03189R  
**BOOKING IN REFERENCE** K03189  
**DESPATCH NOTE** 29425  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 26/05/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Ardgannon	728522	27/04/2016	25/05/2016	669.50	7.81	4.08	0.38
Dunclose Way	728516	27/04/2016	25/05/2016	670.00	6.60	3.44	0.32
Newell Road 1	728515 **	27/04/2016	25/05/2016	669.50	84.00	43.84	4.09
Newell Road 2	728514 **	27/04/2016	25/05/2016	669.50	72.47	37.82	3.53
Newell Road 3	728513 **	27/04/2016	25/05/2016	669.50	80.94	42.24	3.94
Charlemont St, May 1	728539	27/04/2016	25/05/2016	671.00	54.87	28.64	2.68
Charlemont St, May 2	728538	27/04/2016	25/05/2016	671.00	59.03	30.81	2.88
Charlemont St, May 3	728537	27/04/2016	25/05/2016	671.00	56.69	29.59	2.76
Killymon St, May 1	728534	27/04/2016	25/05/2016	671.50	28.27	14.76	1.38
Killymon St, May 2	728535	27/04/2016	25/05/2016	671.50	27.93	14.58	1.36
Killymon St, May 3	728536	27/04/2016	25/05/2016	671.50	28.53	14.89	1.39
The Quays, May 1	728519	27/04/2016	25/05/2016	671.00	8.65	4.52	0.42
The Quays, May 2	728520	27/04/2016	25/05/2016	671.00	7.78	4.06	0.38
The Quays, May 3	728521	27/04/2016	25/05/2016	671.00	8.43	4.40	0.41
Laboratory Blank				671.50	0.06	0.03	0.003

**Comment:** Results are not blank subtracted

Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.

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

**Overall M.U.** 5.2% +/-

**Limit of Detection** 0.010  $\mu\text{gNO}_2$

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

Analysed on UV05 Camspec M550

**Analyst Name** Chris Fraser

**Date of Analysis** 01/06/2016

**Date of Report** 01/06/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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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** K03921R  
**BOOKING IN REFERENCE** K03921  
**DESPATCH NOTE** 28589  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 30/06/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Ardgannon	703572	25/05/2016	29/06/2016	844.50	12.70	6.63	0.78
Dunclare Way	703571	25/05/2016	29/06/2016	844.67	8.41	4.39	0.52
Newell Road 1	703573**	25/05/2016	29/06/2016	844.58	68.00	35.49	4.17
Newell Road 2	703574**	25/05/2016	29/06/2016	844.58	74.18	38.72	4.55
Newell Road 3	703575**	25/05/2016	29/06/2016	844.58	64.18	33.49	3.94
Killymon Street 1	703568	25/05/2016	29/06/2016	843.50	32.96	17.20	2.02
Killymon Street 2	703569	25/05/2016	29/06/2016	843.50	30.29	15.81	1.86
Killymon Street 3	703570	25/05/2016	29/06/2016	843.50	26.15	13.65	1.60
Charlemont St, May 1	703565**	25/05/2016	29/06/2016	843.25	63.09	32.93	3.87
Charlemont St, May 2	703566**	25/05/2016	29/06/2016	843.25	55.25	28.84	3.39
Charlemont St, May 3	703567**	25/05/2016	29/06/2016	843.50	57.73	30.13	3.54
The Quays 1	703562	25/05/2016	29/06/2016	843.25	8.95	4.67	0.55
The Quays 2	703563	25/05/2016	29/06/2016	843.25	9.79	5.11	0.60
The Quays 3	703564	25/05/2016	29/06/2016	843.25	9.44	4.93	0.58
Laboratory Blank				844.67	0.05	0.03	0.003

Comment: Results are not blank subtracted

Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.

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

Overall M.U. 7.8% +/-

Limit of Detection 0.017  $\mu\text{g NO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV 04 Camspec M550

Analyst Name Blazej Fiser

Date of Analysis 06/07/2016

Date of Report 06/07/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number K03921R

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K04774R  
**BOOKING IN REFERENCE** K04774  
**DESPATCH NOTE** 29428  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 01/08/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Ardgannon	741558	29/06/2016	27/07/2016	668.17	7.85	4.10	0.38
Dunclare Way	741553	29/06/2016	27/07/2016	668.17	4.80	2.50	0.23
Newell Road 1	741555	29/06/2016	27/07/2016	668.17	47.99	25.05	2.33
Newell Road 2	741556	29/06/2016	27/07/2016	668.17	46.10	24.06	2.24
Newell Road 3	741557	29/06/2016	27/07/2016	668.17	48.73	25.43	2.37
Killyman Street 1	741550	29/06/2016	27/07/2016	668.33	20.18	10.53	0.98
Killyman Street 2	741551	29/06/2016	27/07/2016	668.33	21.59	11.27	1.05
Killyman Street 3	741552	29/06/2016	27/07/2016	668.33	23.28	12.15	1.13
Charlemont Street 1	741547	29/06/2016	27/07/2016	668.17	58.64	30.61	2.85
Charlemont Street 2	741548	29/06/2016	27/07/2016	668.17	60.93	31.80	2.96
Charlemont Street 3	741549	29/06/2016	27/07/2016	668.17	59.51	31.06	2.89
The Quays 1	741544	29/06/2016	27/07/2016	668.33	5.27	2.75	0.26
The Quays 2	741545	29/06/2016	27/07/2016	668.33	4.78	2.49	0.23
The Quays 3	741546	29/06/2016	27/07/2016	668.33	4.72	2.46	0.23
Laboratory Blank				668.33	0.10	0.05	0.005

**Comment:** Results are not blank subtracted

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

**Overall M.U.** 5.2% +/-

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

**Analysed on** UV05 Camspec M550

**Date of Analysis** 12/08/2016

**Limit of Detection** 0.010 $\mu\text{gNO}_2$

**Analyst Name** Chris Fraser

**Date of Report** 12/08/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number K04774R

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K05296R  
**BOOKING IN REFERENCE** K05296  
**DESPATCH NOTE** 29427  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 25/08/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Ardgannow	756718	27/07/2016	24/08/2016	672.33	9.09	4.74	0.44
Dunclaire Way	756714	27/07/2016	24/08/2016	672.33	6.14	3.21	0.30
Newell Road 1	756715	27/07/2016	24/08/2016	672.33	52.84	27.58	2.58
Newell Road 2	756716	27/07/2016	24/08/2016	672.33	53.23	27.78	2.60
Newell Road 3	756717	27/07/2016	24/08/2016	672.33	50.70	26.46	2.48
Killyman Street 1	756713	27/07/2016	24/08/2016	672.42	24.22	12.64	1.18
Killyman Street 2	756712	27/07/2016	24/08/2016	672.42	26.07	13.61	1.27
Killyman Street 3	756711	27/07/2016	24/08/2016	672.42	24.42	12.74	1.19
Charlemont Street, Moy 1	756708	27/07/2016	24/08/2016	672.42	58.02	30.28	2.84
Charlemont Street, Moy 2	756709	27/07/2016	24/08/2016	672.42	61.28	31.99	3.00
Charlemont Street, Moy 3	756710	27/07/2016	24/08/2016	672.42	56.62	29.55	2.77
The Quays 1	756705	27/07/2016	24/08/2016	672.42	7.31	3.81	0.36
The Quays 2	756706	27/07/2016	24/08/2016	672.42	7.34	3.83	0.36
The Quays 3	756707	27/07/2016	24/08/2016	672.42	6.97	3.64	0.34
Laboratory Blank				672.42	0.10	0.05	0.005

**Comment:** Results are not blank subtracted

Exposure times were calculated from start and finish times given on the exposure sheet.

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

Overall M.U.  $\pm 5.8\%$

Limit of Detection 0.010  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analyst Name Blazej Fiser

Analysed on UV 08 Camspec M550

Date of Analysis 02/08/2016

Date of Report 05/09/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number K05296R

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K06016R  
**BOOKING IN REFERENCE** K06016  
**DESPATCH NOTE** 29428  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 28/09/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Ardgannon	770836	24/08/2016	27/09/2016	816.00	10.23	5.34	0.61
Dunclare Way	770832	24/08/2016	27/09/2016	816.08	6.41	3.35	0.38
Newell Road 1	770838**	24/08/2016	27/09/2016	815.92	56.73	29.61	3.36
Newell Road 2	770838**	24/08/2016	27/09/2016	815.92	57.28	29.89	3.40
Newell Road 3	770837	24/08/2016	27/09/2016	815.92	50.19	26.19	2.98
Killyman Street 1	770835	24/08/2016	27/09/2016	815.50	28.43	14.84	1.69
Killyman Street 2	770834	24/08/2016	27/09/2016	815.50	30.25	15.79	1.79
Killyman Street 3	770833	24/08/2016	27/09/2016	815.50	26.43	13.80	1.57
Charlemont St Moy 1	770845**	24/08/2016	27/09/2016	815.92	68.11	35.55	4.04
Charlemont St Moy 2	770844**	24/08/2016	27/09/2016	815.92	63.07	32.92	3.74
Charlemont St Moy 3	770843**	24/08/2016	27/09/2016	815.92	72.85	38.02	4.32
The Quays 1	770842	24/08/2016	27/09/2016	816.00	6.54	3.41	0.39
The Quays 2	770841	24/08/2016	27/09/2016	816.00	7.34	3.83	0.44
The Quays 3	770840	24/08/2016	27/09/2016	816.00	8.72	4.55	0.52
Laboratory Blank				816.08	0.17	0.09	0.010

**Comment:** Results are not blank subtracted

Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.

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

**Overall M.U.** 5.2% +/-

**Limit of Detection** 0.010 $\mu\text{gNO}_2$

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

Analysed on UV05 Camspec M550

**Analyst Name** Charlotte Grove

**Date of Analysis** 03/10/2016

**Date of Report** 03/10/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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Report Number K06016R

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L. Gates, Laboratory Manager

## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K07134R  
**BOOKING IN REFERENCE** K07134  
**DESPATCH NOTE** 29429  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 07/11/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Dunclare Way	785521	27/09/2016	28/10/2016	743.00	11.52	6.01	0.62
Newell Road 1	785522**	27/09/2016	28/10/2016	743.15	57.64	30.08	3.11
Newell Road 2	785520**	27/09/2016	28/10/2016	743.15	63.75	33.27	3.44
Newell Road 3	785519**	27/09/2016	28/10/2016	743.15	68.54	35.77	3.70
Killyman Street 1	785518	27/09/2016	28/10/2016	745.00	34.52	18.02	1.87
Killyman Street 2	785517	27/09/2016	28/10/2016	745.00	34.36	17.93	1.86
Killyman Street 3	785516	27/09/2016	28/10/2016	745.00	30.27	15.80	1.64
Charlemont Street 1	785515	27/09/2016	28/10/2016	744.75	50.00	26.10	2.71
Charlemont Street 2	785514	27/09/2016	28/10/2016	744.75	46.45	24.24	2.51
Charlemont Street 3	785513	27/09/2016	28/10/2016	744.75	49.55	25.86	2.68
The Quays 1	785527	27/09/2016	28/10/2016	744.75	12.30	6.42	0.67
The Quays 2	785526	27/09/2016	28/10/2016	744.75	12.42	6.48	0.67
The Quays 3	785525	27/09/2016	28/10/2016	744.75	13.19	6.88	0.71
Laboratory Blank				745.00	0.09	0.05	0.005

**Comment: Results are not blank subtracted**

**Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.**

**Exposure times were calculated from start and finish times given on the exposure sheet.**

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

**Overall M.U.** 5.2% +/-

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

**Analyst Name** Ben Whitmarsh

**Date of Analysis** 21/11/2016

**Limit of Detection** 0.010 $\mu\text{gNO}_2$

**Analysed on** UV05 CamSpec M550

**Report Checked By** Adam Robinson

**Date of Report** 21/11/2016


**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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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Report Number K07134R

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K07746R  
**BOOKING IN REFERENCE** K07746  
**DESPATCH NOTE** 29430  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 05/12/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Dunclare Way	800709	28/10/2016	01/12/2016	816.50	14.57	7.61	0.86
Newell Road 1	800708**	28/10/2016	01/12/2016	816.50	72.22	37.70	4.29
Newell Road 2	800707**	28/10/2016	01/12/2016	816.50	66.25	34.58	3.93
Newell Road 3	800706**	28/10/2016	01/12/2016	816.50	76.15	39.74	4.52
Killyman Street 1	800693	28/10/2016	01/12/2016	816.00	31.76	16.58	1.88
Killyman Street 2	800692	28/10/2016	01/12/2016	816.00	32.83	17.13	1.95
Killyman Street 3	800691	28/10/2016	01/12/2016	816.00	34.64	18.08	2.05
Charlemont Street 1	800690**	28/10/2016	01/12/2016	816.00	73.61	38.42	4.37
Charlemont Street 2	800689**	28/10/2016	01/12/2016	816.00	71.75	37.45	4.26
Charlemont Street 3	800688**	28/10/2016	01/12/2016	816.00	73.64	38.44	4.37
The Quays 1	800686	28/10/2016	01/12/2016	816.00	14.47	7.55	0.86
The Quays 2	800687	28/10/2016	01/12/2016	816.00	13.89	7.25	0.82
The Quays 3	800685	28/10/2016	01/12/2016	816.00	14.00	7.31	0.83
Laboratory Blank				816.50	0.05	0.03	0.003

**Comment:** Results are not blank subtracted

**Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.**

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

**Overall M.U.**  $\pm 7.8\%$

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

**Analyst Name** Ben Whitmarsh

**Date of Analysis** 19/12/2016

**Limit of Detection** 0.010  $\mu\text{gNO}_2$

Analysed on UV05 Camspec M550

**Report Checked By** Adam Robinson

**Date of Report** 20/12/2016

**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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** L00621R  
**BOOKING IN REFERENCE** L00621  
**DESPATCH NOTE** 29431  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 13/01/2017

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Dunclare Way	817963	01/12/2016	06/01/2017	864.00	14.23	7.42	0.89
Newell Road 1	817924**	01/12/2016	06/01/2017	864.00	63.52	33.15	3.99
Newell Road 2	817923**	01/12/2016	06/01/2017	864.00	68.05	35.52	4.27
Newell Road 3	817922**	01/12/2016	06/01/2017	864.00	58.74	30.66	3.69
Killyman Street 1	817966	01/12/2016	06/01/2017	864.00	37.47	19.56	2.35
Killyman Street 2	817965	01/12/2016	06/01/2017	864.00	35.63	18.60	2.24
Killyman Street 3	817964	01/12/2016	06/01/2017	864.00	35.88	18.72	2.25
Charlemont St 1	817930**	01/12/2016	06/01/2017	864.00	80.72	42.13	5.07
Charlemont St 2	817929**	01/12/2016	06/01/2017	864.00	67.46	35.21	4.24
Charlemont St 3	817928**	01/12/2016	06/01/2017	864.00	73.32	38.27	4.60
The Quays 1	817927	01/12/2016	06/01/2017	864.00	13.55	7.07	0.85
The Quays 2	817926	01/12/2016	06/01/2017	864.00	14.32	7.47	0.90
The Quays 3	817925	01/12/2016	06/01/2017	864.00	13.50	7.05	0.85
Laboratory Blank				864.00	0.30	0.16	0.019

Comment: Results are not blank subtracted

Tubes marked \*\* were diluted to read within our UKAS accredited calibration range.

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

Overall M.U.  $\pm 7.8\%$

Tube Preparation : 20% TEA / Water

Analyst Name Joanna Kowalewska

Date of Analysis 30/01/2017

Limit of Detection 0.010  $\mu\text{gNO}_2$

Analysed on UV 08 CamSpec M550

Report Checked By Adam Robinson

Date of Report 30/01/2017


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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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Report Number L00621R

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K00824R  
**BOOKING IN REFERENCE** K00824  
**DESPATCH NOTE** 23999  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 04/02/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Lawford Street Moneymore	663677	05/01/2016	02/02/2016	672.00	28.41	14.83	1.39
William Street Cookstown	663678	05/01/2016	02/02/2016	672.00	31.04	16.20	1.52
James Street Cookstown	663679	05/01/2016	02/02/2016	672.00	45.02	23.49	2.20
Church Street Cookstown	663680	05/01/2016	02/02/2016	672.00	54.84	28.62	2.68
Killymoon Street Cookstown	663681	05/01/2016	02/02/2016	672.00	38.39	20.04	1.88
Smith Street Moneymore	663682	05/01/2016	02/02/2016	672.00	30.31	15.82	1.48
Stanard Street Moneymore	663683	05/01/2016	02/02/2016	672.00	39.22	20.47	1.92
Conyngnam Street Moneymore	663684	05/01/2016	02/02/2016	672.00	19.22	10.03	0.94
Laboratory Blank				672.00	0.10	0.05	0.005

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

Overall M.U.  $\pm 5.8\%$

Limit of Detection 0.010  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV 08 Camspec M550

Analyst Name Blazej Fiser

Date of Analysis 08/02/2016

Date of Report 08/02/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K01607R  
**BOOKING IN REFERENCE** K01607  
**DESPATCH NOTE** 24000  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 08/03/2016

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Lawford Street Moneymore	680068	02/02/2016	01/03/2016	672.00	44.36	23.15	2.17
Nilliam Street Cookstown	680069	02/02/2016	01/03/2016	672.00	35.49	18.53	1.73
James Street Cookstown	680070	02/02/2016	01/03/2016	672.00	40.59	21.18	1.98
Church Street Cookstown	680071	02/02/2016	01/03/2016	672.00	40.21	20.99	1.96
Killymoon Street Cookstown	680072	02/02/2016	01/03/2016	672.00	41.45	21.63	2.02
Smith Street Cookstown	680073	02/02/2016	01/03/2016	672.00	34.32	17.91	1.68
Stonard Street Moneymore	680074	02/02/2016	01/03/2016	672.00	42.37	22.12	2.07
Conyngnam Street Moneymore	680075	02/02/2016	01/03/2016	672.00	22.86	11.93	1.12
Laboratory Blank				672.00	0.16	0.09	0.008

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

**Overall M.U.** 5.2% +/- **Limit of Detection** 0.010 $\mu\text{gNO}_2$

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

**Analysed on** UV05 Camspec M550

**Analyst Name** Chris Fraser

**Date of Analysis** 15/03/2016 **Date of Report** 15/03/2016

**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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K02317R  
**BOOKING IN REFERENCE** K02317  
**DESPATCH NOTE** 24001  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 11/04/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Landford Street Moneymore	892552	01/03/2016	01/04/2016	744.00	43.20	22.55	2.34
William Street Cookstown	892553	01/03/2016	01/04/2016	744.00	30.51	15.92	1.65
James Street Cookstown	892554	01/03/2016	01/04/2016	744.00	36.64	19.12	1.98
Church Street Cookstown	892555	01/03/2016	01/04/2016	744.00	32.45	16.93	1.75
Killymoon Street Cookstown	892556	01/03/2016	01/04/2016	744.00	39.94	20.85	2.16
Smith Street Cookstown	892557	01/03/2016	01/04/2016	744.00	31.29	16.33	1.69
Conyngham Street Moneymore	892558	01/03/2016	01/04/2016	744.00	42.45	22.15	2.30
Stonyard Street Cookstown	892559	01/03/2016	01/04/2016	744.00	15.67	8.18	0.85
Laboratory Blank				744.00	0.11	0.06	0.006

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

**Overall M.U.** 7.8% +/-

**Limit of Detection** 0.017  $\mu\text{gNO}_2$

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

**Analysed on** UV 04 Camspec M550

**Analyst Name** Anna Paczosa

**Date of Analysis** 19/04/2016

**Date of Report** 20/04/2016

**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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K02827R

BOOKING IN REFERENCE K02827

DESPATCH NOTE 29424

CUSTOMER Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN

DATE SAMPLES RECEIVED 09/05/2016

#### JOB NUMBER

Location	Sample Number	Exposure Data		Time (hr.)	TOTAL		
		Date On	Date Off		$\mu\text{g}/\text{m}^3$ *	ppb *	$\mu\text{g NO}_2$
Lawford Street Moneymore	712658	01/04/2016	03/05/2016	764.00	33.39	17.43	1.85
William Street Cookstown	712659	01/04/2016	03/05/2016	764.00	1.56	0.82	0.09
James Street Cookstown	712660	01/04/2016	03/05/2016	764.00	25.92	13.53	1.44
Church Street Cookstown	712661	01/04/2016	03/05/2016	764.00	28.03	14.63	1.56
Smith Street Cookstown	712662	01/04/2016	03/05/2016	764.00	22.02	11.49	1.22
Conyngnam Street Moneymore	712663	01/04/2016	03/05/2016	764.00	30.47	15.90	1.69
Stonyard Street Cookstown	712664	01/04/2016	03/05/2016	764.00	14.81	7.73	0.82
Laboratory Blank				764.00	0.18	0.09	0.010

Comment: Results are not blank subtracted

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

Overall M.U. 5.2% +/-

Limit of Detection 0.010  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV05 Camspec M550

Analyst Name Chris Fraser

Date of Analysis 16/05/2016

Date of Report 20/05/2016

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.

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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K03452R

BOOKING IN REFERENCE K03452

DESPATCH NOTE 29425

CUSTOMER Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

DATE SAMPLES RECEIVED 06/06/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	TOTAL	
		Date On	Date Off			ppb *	$\mu\text{g NO}_2$
Lawford Street Moneymore	726525	03/05/2016	31/05/2016	672.00	32.35	16.89	1.58
William Street Cookstown	726526	03/05/2016	31/05/2016	672.00	25.33	13.22	1.24
James Street Cookstown	726527	03/05/2016	31/05/2016	672.00	29.83	15.57	1.46
Church Street Cookstown	726528	03/05/2016	31/05/2016	672.00	30.39	15.86	1.48
Killymon Street	726530	03/05/2016	31/05/2016	672.00	31.26	16.31	1.53
Smith Street Moneymore	726531	03/05/2016	31/05/2016	672.00	29.56	15.43	1.44
Stonyard Street Moneymore	726532	03/05/2016	31/05/2016	672.00	38.82	20.26	1.90
Conyngham Street Moneymore	508032	03/05/2016	31/05/2016	672.00	11.54	6.02	0.56
Laboratory Blank				672.00	0.16	0.09	0.008

Comment: Results are not blank subtracted

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

Overall M.U. 7.8% +/-

Limit of Detection 0.017  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV 04 Camspec M550

Analyst Name Blazej Fiser

Date of Analysis 22/06/2016

Date of Report 23/06/2016

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

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K04340R  
**BOOKING IN REFERENCE** K04340  
**DESPATCH NOTE** 29426  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN

**DATE SAMPLES RECEIVED** 12/07/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	TOTAL	
		Date On	Date Off			ppb *	$\mu\text{g NO}_2$
Lawford Street Moneymore	741515	31/05/2016	01/07/2016	744.00	37.70	19.68	2.04
William Street Cookstown	741516	31/05/2016	01/07/2016	744.00	32.40	16.91	1.75
Church Street Cookstown	741517	31/05/2016	01/07/2016	744.00	26.57	13.87	1.44
Killymoon Street Cookstown	741518	31/05/2016	01/07/2016	744.00	26.83	14.00	1.45
Smith Street Moneymore	741519	31/05/2016	01/07/2016	744.00	27.07	14.13	1.46
Stonyard Street Moneymore	741520	31/05/2016	01/07/2016	744.00	40.40	21.08	2.18
Conyngham Street Moneymore	741521	31/05/2016	01/07/2016	744.00	12.30	6.42	0.66
Laboratory Blank				744.00	0.09	0.05	0.005

**Comment:** Results are not blank subtracted

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

**Overall M.U.** 7.8% +/-

**Limit of Detection** 0.017  $\mu\text{gNO}_2$

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

Analysed on UV 04 Camspec M550

**Analyst Name** Jess Crow

**Date of Analysis** 27/07/2016

**Date of Report** 28/07/2016

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

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## LABORATORY ANALYSIS REPORT

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

REPORT NUMBER K04990R

BOOKING IN REFERENCE K04990

DESPATCH NOTE 29427

CUSTOMER Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN

DATE SAMPLES RECEIVED 08/08/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Lawford Street Moneymore	756675	01/07/2016	02/08/2016	772.00	29.95	15.63	1.68
William Street Cookstown	756676	01/07/2016	02/08/2016	772.00	19.74	10.30	1.11
Church Street Cookstown	756677	01/07/2016	02/08/2016	772.00	22.99	12.00	1.29
Killymoon Street Cookstown	756678	01/07/2016	02/08/2016	772.00	28.25	14.74	1.59
Smith Street Cookstown	756679	01/07/2016	02/08/2016	772.00	20.22	10.55	1.13
Stonyard Street Cookstown	756681	01/07/2016	02/08/2016	772.00	26.60	13.88	1.49
Conyngham Street Moneymore	756682	01/07/2016	02/08/2016	772.00	11.31	5.90	0.63
Laboratory Blank				772.00	0.14	0.07	0.008

Comment: Results are not blank subtracted

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

Overall M.U.  $\pm 5.8\%$

Limit of Detection 0.010  $\mu\text{gNO}_2$

Tube Preparation : 20% TEA / Water

Analysed on UV 08 Camspec M550

Analyst Name Blazej Fiser

Date of Analysis 18/08/2016

Date of Report 18/08/2016

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

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K05788R  
**BOOKING IN REFERENCE** K05788  
**DESPATCH NOTE** 29428  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN

**DATE SAMPLES RECEIVED** 13/09/2016

Location	Sample	Exposure Data			Time (hr.)	µg/m <sup>3</sup> *	ppb *	TOTAL
	Number	Date On	Date Off	µg NO <sub>2</sub>				
Lanford Street	770806	02/08/2016	06/09/2016	840.00	36.74	19.17	2.24	
William Street Cookstown	770807	12/08/2016	06/09/2016	600.00	1.87	0.98	0.08	
James Street Cookstown	770808	02/08/2016	06/09/2016	840.00	30.57	15.96	1.87	
Church Street Cookstown	770809	02/08/2016	06/09/2016	840.00	24.36	12.72	1.49	
Killymoon Street Cookstown	770810	02/08/2016	06/09/2016	840.00	26.54	13.85	1.62	
Smith Street Cookstown	770811	02/08/2016	06/09/2016	840.00	25.01	13.05	1.53	
Stonyard Street Cookstown	770812	02/08/2016	06/09/2016	840.00	33.47	17.47	2.04	
Conyngnam Street Money more	770813	02/08/2016	06/09/2016	840.00	12.34	6.44	0.75	
Laboratory Blank				840.00	0.13	0.07	0.008	

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

**Overall M.U.** 7.8% +/-

**Limit of Detection** 0.017  $\mu\text{gNO}_2$

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

**Analysed on** UV 04 Camspec M550

**Analyst Name** Jess Crow

**Date of Analysis** 21/09/2016

**Date of Report** 21/09/2016

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

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K06447R  
**BOOKING IN REFERENCE** K06447  
**DESPATCH NOTE** 28589  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 12/10/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Lawford Street Moneymore	703576	06/09/2016	05/10/2016	696.00	41.21	21.51	2.08
William Street Cookstown	703577	06/09/2016	05/10/2016	696.00	25.24	13.18	1.28
James Street Cookstown	703578	06/09/2016	05/10/2016	696.00	34.94	18.23	1.77
Church Street Cookstown	703579	06/09/2016	05/10/2016	696.00	25.90	13.52	1.31
Killymoon Street Cookstown	703580	06/09/2016	05/10/2016	696.00	31.24	16.31	1.58
Smith Street Moneymore	703581	06/09/2016	05/10/2016	696.00	35.75	18.66	1.81
Stanyard street Moneymore	703582	06/09/2016	05/10/2016	696.00	33.22	17.34	1.68
Corynham Street Moneymore	703583	06/09/2016	05/10/2016	696.00	15.66	8.17	0.79
Laboratory Blank				696.00	0.18	0.09	0.009

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

**Overall M.U.** 7.8% +/-

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

**Analysed on** UV 04 Camspec M550

**Limit of Detection** 0.017 $\mu\text{gNO}_2$

**Analyst Name** Charlotte Grove

**Date of Analysis** 21/10/2016

**Date of Report** 21/10/2016

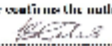
**Analysis carried out in accordance with documented in-house Laboratory Method GLM7**

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Report Number K06447R

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K06447R  
**BOOKING IN REFERENCE** K06447  
**DESPATCH NOTE** 28589  
**CUSTOMER** Mid Ulster District Council Attn: Susan Martin  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 12/10/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Lawford Street Moneymore	703576	06/09/2016	05/10/2016	696.00	41.21	21.51	2.08
William Street Cookstown	703577	06/09/2016	05/10/2016	696.00	25.24	13.18	1.28
James Street Cookstown	703578	06/09/2016	05/10/2016	696.00	34.94	18.23	1.77
Church Street Cookstown	703579	06/09/2016	05/10/2016	696.00	25.90	13.52	1.31
Killymoon Street Cookstown	703580	06/09/2016	05/10/2016	696.00	31.24	16.31	1.58
Smith Street Moneymore	703581	06/09/2016	05/10/2016	696.00	35.75	18.66	1.81
Stanyard street Moneymore	703582	06/09/2016	05/10/2016	696.00	33.22	17.34	1.68
Corynham Street Moneymore	703583	06/09/2016	05/10/2016	696.00	15.66	8.17	0.79
Laboratory Blank				696.00	0.18	0.09	0.009

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

**Overall M.U.** 7.8% +/-

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

**Analysed on** UV 04 Camspec M550

**Limit of Detection** 0.017 $\mu\text{gNO}_2$

**Analyst Name** Charlotte Grove

**Date of Analysis** 21/10/2016

**Date of Report** 21/10/2016

**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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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Report Number K06447R

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Gradko International Ltd  
This signature confirms the authenticity of these results  
Signed:   
I. Gates, Laboratory Manager



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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** K07930R  
**BOOKING IN REFERENCE** K07930  
**DESPATCH NOTE** 29431  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry,  
BT45 6EN  
**DATE SAMPLES RECEIVED** 13/12/2016

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Lawford Street Moneymore	817951	07/11/2016	05/12/2016	672.00	44.26	23.10	2.16
Church Street Cookstown	817954	07/11/2016	05/12/2016	672.00	34.81	18.17	1.70
Killymoon Street Cookstown	817955	07/11/2016	05/12/2016	672.00	43.95	22.94	2.15
Smith Street Cookstown	817956	07/11/2016	05/12/2016	672.00	38.74	20.22	1.89
Stonard Street Moneymore	817957	07/11/2016	05/12/2016	672.00	43.76	22.84	2.14
Conyngnam Street Moneymore	817958	07/11/2016	05/12/2016	672.00	24.10	12.58	1.18
Laboratory Blank				672.00	0.08	0.04	0.004

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

**Overall M.U.**  $\pm 7.8\%$

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

**Analyst Name** Ben Whitmarsh

**Date of Analysis** 20/12/2016

**Limit of Detection** 0.010  $\mu\text{gNO}_2$

Analysed on UV05 CamSpec M550

**Report Checked By** Adam Robinson

**Date of Report** 20/12/2016

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

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## LABORATORY ANALYSIS REPORT

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

**REPORT NUMBER** L00781R  
**BOOKING IN REFERENCE** L00781  
**DESPATCH NOTE** 29432  
**CUSTOMER** Mid Ulster District Council Attn: Fiona McClements  
Environmental Health Dept,  
50 Ballyronan Road,  
Magherafelt,  
Co Londonderry.  
BT45 6EN  
**DATE SAMPLES RECEIVED** 23/01/2017

Location	Sample Number	Exposure Data		Time (hr.)	$\mu\text{g}/\text{m}^3$ *	ppb *	TOTAL $\mu\text{g NO}_2$
		Date On	Date Off				
Lawford Street Moneymore	832512	05/12/2016	10/01/2017	864.00	46.81	24.43	2.94
William Street Cookstown	832513	05/12/2016	10/01/2017	864.00	34.81	18.17	2.19
James Street Cookstown	832514	05/12/2016	10/01/2017	864.00	42.21	22.03	2.65
Church Street Cookstown	832515	05/12/2016	10/01/2017	864.00	33.41	17.44	2.10
Killymoon Street Cookstown	832516	05/12/2016	10/01/2017	864.00	42.52	22.19	2.67
Smith Street Moneymore	832517	05/12/2016	10/01/2017	864.00	38.05	19.86	2.39
Stonard Street Moneymore	832518	05/12/2016	10/01/2017	864.00	45.53	23.76	2.86
Corynham Street Moneymore	832519	05/12/2016	10/01/2017	864.00	22.35	11.67	1.40
Laboratory Blank				864.00	0.18	0.09	0.011

**Comment: Results are not blank subtracted**

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

**Overall M.U.**  $\pm 7.8\%$

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

**Analyst Name** Ben Whitmarsh

**Limit of Detection** 0.010  $\mu\text{gNO}_2$

Analysed on UV05 CamSpec M550

**Report Checked By** Adam Robinson

**Date of Analysis** 31/01/2017

**Date of Report** 31/01/2017

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. This report is not to be reproduced, except in full, without the written permission of Gradko International Ltd.  
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Report Number L00781R

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Gradko International Ltd  
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Signed: L. Gates, Laboratory Manager