Omagh District Council

2009 Air Quality Updating and Screening Assessment

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

December 2009

Local Authority Officer	David Gillis Senior EHO

Department	Environmental Health Department
Address	Lisnamallard House Old Mountfield Road Omagh BT79 7EG
Telephone	028 82 256202
e-mail	david.gillis@omagh.gov.uk

Report Reference number	
Date	December 2009

Executive Summary

This report comprises the Update and Screening Assessment for the Omagh District Council area, providing a review and assessment of new monitoring data and potential new sources of pollutants within the area.

Other than changes to road infrastructure, there have been no new or significantly changed sources of pollutants identified which may cause potential exceedances of the air quality objective levels within the council area.

Table of contents

Appendices

1 Introduction

1.1 Description of Local Authority Area

Omagh District Council is located within County Tyrone and has an area of approximately 1128km^2 (440 square miles) making it the second largest local government district in terms of area in Northern Ireland. In June 2007, the district was an estimated to have a population of 51,508. Omagh District Council is located some 70 miles from Belfast City Council and 34 miles from Derry City Council. Information on Omagh District Council maybe obtained on the website www.omagh.gov.uk

It occupies a central position in the west of the province with much of the District being characterised as marginal upland with its northern boundaries rising to over 400m above sea level in the Sperrin Mountain Range. The District is largely centred on Omagh, being the county town if Tyrone with a number of satellite villages and a dispersed rural settlement pattern typical of rural Northern Ireland. More information on the area is available on the web site www.omagh.gov.uk

The District is totally reliant on road based transport with two main routes dominating the roadways – the A5 running from south east to north west which is essentially the main Belfast/Londonderry route and the A505/A32 running from north-east to south-west which connects to the neighbouring main market towns of Cookstown to the east and Enniskillen to the west. Both routes run through Omagh town.

Omagh District does not have a large manufacturing base. There are two industrial estates within Omagh town, which contain mainly service related warehousing and a number of small engineering works.

1.2 Purpose of Report

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

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 micrograms per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

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

1.4 Summary of Previous Review and Assessments

Stage 1 Review and Assessment

In 2001, Omagh District Council completed a Stage one assessment which involved an initial screening of industrial, transport and any other sources of pollution that could have a significant impact within the district council area. The assessment concluded that three of the strategy pollutants namely nitrogen dioxide, sulphur dioxide, and particulate matter (PM_{10}) were at risk of exceeding the strategy objections. In accordance with the current technical guidance, Omagh District Council was required to proceed to a stage 2/3 review and assessment of these pollutants.

Stage 2 Review and Assessment

The stage 2 review and assessment was a more detailed assessment of all the pollutants identified as significant locally in the first stage.

Nitrogen Dioxide

The second stage assessment for NO_2 focused upon relevant locations affected by road traffic at a number of road sections/junctions. The assessment relied upon the application of the Design Manual for Roads and Bridges (DMRB) model and local diffusion tube monitoring data. The results show that it is unlikely that either the annual mean or hourly NO_2 objective will be exceeded at relevant reception locations.

Particulate Matter (PM_{10}) and Sulphur Dioxide

A Second Stage Assessment was also carried out for PM_{10} arising from traffic sources at the respective road sections/junctions using the DMRB model. The modelling predicted no exceedances of the PM_{10} objective from traffic sources.

A number of fugitive emissions from industrial sources of PM_{10} were examined as part of the Second Stage Assessment. Based on recent findings in GB and the results of local monitoring at a hard rock quarry it was considered that it was not necessary to proceed to a Third Stage Assessment in respect of these sources.

The absence of reliable locally monitored data necessitated Omagh District Council to proceed directly to a Third Stage Assessment for SO_2 and PM_{10} in five 1km x 1km grid squares as identified from the Stage One Report. A Fuel Use Survey was commissioned to obtain estimates of PM_{10} and SO_2 emissions which were used in the modelling programme (ADMS model version 3.1). The modelling exercise suggests that it is unlikely that there will be an exceedance of the SO_2 or PM_{10} objectives in the modelled areas.

The first round of the review and assessment process concluded that it was not necessary to declare an Air Quality Management Area within the Omagh District Council area.

Following the first round of review and assessment, the reports outlined below were prepared and submitted to ensure continuity of the Air Quality Review and Assessment process.

- Progress Report-2005
- Updating and Screening Report-2006
- Progress Report-2007
- Progress Report 2008

The Updating and Screening Assessment has concluded that for each of the prescribed pollutants, air quality objectives are likely to be met in the Omagh District Council area and that it is not necessary to proceed to the Detailed Assessment Stage. The report did however suggest that upon completion of the final phase of the through-pass further consideration of potential impact of the roadway should be undertaken.

The final phase of A5 Omagh Throughpass was completed in August 2006 and represents the completion of the major re-alignment of the urban road network to Omagh town. The majority of the scheme is well outside the main urban area and serve to link the earlier phases of the throughpass with the regional networks. A monitoring programme was initiated to examine the potential impact of the new infrastructure on NO_2 levels. This involved NO2 diffusion tube monitoring at three locations:

- Crevenagh Road, Omagh
- Dublin Road, Omagh
- Doogary, Omagh

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automated monitoring sites in the Omagh District Council area.

2.1.2 Non-Automatic Monitoring

Details of the QA/QC for the supply and analysis of diffusion tubes is included in **Appendix A** to this report.

Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQ MA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
Crevenagh Road	roadside	245989 372784	NO_2	No	Y	5m	Y
Dublin Road	roadside	245735 372241	NO_2	No	Y	2m	Y
Doogary	roadside	246314 370718	NO_2	No	Y	3m	Y

The locations of the NO_2 diffusion tube monitoring sites are indicated on the location map in **Appendix B** to this report.

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

There are no automated monitoring sites in the Omagh District Council area.

Diffusion Tube Monitoring Data

Passive diffusion tube monitoring has been undertaken at three roadside sites namely Crevenagh Road, Dublin Road and at Doogary. There is relevant exposure at each of these locations as members of the public are likely to be regularly exposed as close to building facades of residential properties, schools, hospitals.

Table 2.3a Results of Monitoring for Nitrogen Dioxide, 2008

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentration 2008 (μg/m3) Adjusted for bias (x0.9)	Data Capture 2009 (for Jan-Sep) %	Mean concentration January-September 2009 (μg/m3) (Adjusted using 2008 bias (x0.9)
1	Crevenagh Road, Omagh	No	92	19.15	100	16.27
2	Dublin Road, Omagh	No	100	26.76	100	23.6
3	Doogary, Omagh	No	100	18.54	89	18.63

Table 2.3b Results of Diffusion Tube Monitoring for Nitrogen Dioxide

Site ID	Location	Within AQMA?	Annual mean concentrations ($\mu g/m^3$) Adjusted using 2008 bias factor of 0.9	
			2008	2009 (Jan-Sep)
1	Crevenagh Road, Omagh	No	19.15	16.27
2	Dublin Road, Omagh	No	26.76	23.6
3	Doogary, Omagh	No	18.54	18.63

The data indicates that there have been no exceedances of the annual mean limit of 40ugm^{-3} for nitrogen dioxide at any of the monitoring locations.

2.2.2 PM_{10}

No PM_{10} monitoring is undertaken by Omagh District Council.

2.2.3 Sulphur Dioxide

No SO_2 monitoring is undertaken by Omagh District Council.

2.2.4 Benzene

No benzene monitoring is undertaken by Omagh District Council.

2.2.5 Other pollutants monitored

No other pollutants are monitored by Omagh District Council.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

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

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

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

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

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

3.4 Junctions

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

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

Construction of the A5 Omagh Throughpass is now complete and the data available indicates that the traffic flow is greater than 10,000 vehicles per day. There is also relevant exposure within 10 metres of the road. However, monitoring data indicates levels of NO_2 being significantly lower than the annual mean limit of $40ugm^{-3}$ at all three monitoring locations.

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

Omagh District Council confirms there are no relevant bus stations in the district.

4 Other Transport Sources

4.1 Airports

Omagh District Council confirms there are no relevant bus stations in the district.

4.2 Railways (Diesel and Steam Trains)

Omagh District Council confirms there are no railways in the district.

4.3 Ports (Shipping)

Omagh District Council confirms there are no ports in the district.

5 Industrial Sources

5.1 Industrial Installations

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

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

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

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

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

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

5.2 Major Fuel (Petrol) Storage Depots

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

5.3 Petrol Stations

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

5.4 Poultry Farms

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

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

There are two premises within the Omagh District Council area to be assessed. See Appendix C and D for location maps.

Using the following information:

- LAQM.TG (09) and Technical Guidance: Screening Assessment for Biomass Boilers. (AEA,2008)

- Specific plant details including

  i. Height of stack above ground
  ii. Diameter of stack
  iii. Dimensions of buildings within a distance of 5 times the stack height
  iv. Description of combustion appliance
  v. Maximum rates of emission of particular matter and oxides of nitrogen when operating at capacity

- Nomographs, presented in LAQM.TG (09) are used to assess whether the biomass combustion installation is likely to lead to an exceedance of the Air Quality Strategy 24-hour PM_{10} objective on the mean annual objective for NO_2

OMAGH LEISURE CENTRE

The following information has been provided with regard to the Omagh Leisure Centre biomass boiler:-

Stack Height	=	20m above ground
Stack Diameter	=	0.35m
Exit Velocity	=	$8.7ms^{-1}$
Installation Rating	=	500kw
PM_{10} Emission Rate	=	*240g/GJ
NO_2 Emission rate	=	$134.8mg/m^3$

*In accordance with the technical guidance default emission factor for PM_{10} has been used to calculate the maximum emission rate (EMEP/CORINAIR Guidebook 2007

Max. PM_{10} Emission Rate 500kw = $240g/GJ \times 500kw \times 10^{-6} = 0.12g/s$

Max emission of NO_2

Stack exhaust area	=	$\lambda \times (0.35/2)^2 = 0.1m^2$
Vol. of gas emitted per second	=	$0.1 \times 8.7 = 0.87m^3/_s$
Mass emitted per second	=	$135 \times 0.87 = 117.4mg/s = 0.117g/s$

Background concentrations for 2008 of both PM_{10} and NO_2 have been obtained from the Air Quality Archive 1 x 1 km background maps for the grid square centred at 245500; 373500:

Background PM_{10} (2008) = 10.50mg/m^3
Background No_2 (2008) = 7.10mg/m3

'Background-adjusted' emission rates (E_A) are calculated using the following formula, to assess the potential impacts of the biomass burner with regards to the Air Quality Strategy 24-hours mean objective for PM_{10} and the annual mean objective for NO_2 respectively, where E is the emission rate in g/s for the plant at operating capacity, and G is the annual average background concentration in mg/m^3 is calculated as:

$PM_{10}E_A$[1] = E/(32-G) = 0.12g/s / (32µg/m^3-10.50µg/m^3) = 0.00558g/s

NO_2E_A[2] = E/(40-G) = 0.117/ (40µg -7.10µg/m^3) = 0.00355g/s

1. 32µg/m^3 represents the annual average concentration at which given a typical distribution of concentrations, with time the 90th percentile of the 24 hour means will exceed the objective.

2. 40µg/m^3 represents the annual mean objective.

The table below shows the minimum effective stack height, below which further assessment of the boiler may be required. For the NO_2 annual mean objective, the effective stack height would have to be no lower for further assessment to be considered. For the 24 hour mean objective for PM_{10} the effective chimney height would have to be 10m or below for further assessment to be considered.

The stack height is adjusted to reflect the potential influence the attached building has upon dispersion characteristics. In this case the effective stack height C is calculated using the following formula where V is the actual stack height, and H is the height of the tallest building within a distance of 5 times the stack height:

C = 1.66 (V – H) = 1.66 x (20 – 8) = 19.9m

With reference to the nomographs provided in LAQM.TG (09) the table summarises the emission data for Omagh Leisure Centre:-

POLLUTANT	NO_2	PM_{10}
AIR QUALITY OBJECTIVE	ANNUAL MEAN	24-HOUR
Maximum emission rate (g/s)	0.11	0.12
2008 Background Concentration (µg/m^3)	7.10	10.50
2008 Background-Adjusted Emission Rate (g/s)	0.0035	0.0055
[A] Minimum Effective Stack Height (m)	4	10
[B] Threshold Background adjusted Emission rate for 20m effective Stack Height (g/s)	0.065	0.017

Note A Minimum effective stack height below which further assessment may be .

required.

B Household background – adjusted emission rate for a 20m effective stack height, above which further assessment of the boiler may be required.

Based upon the current specification of the boiler the screening study suggests that further assessment with regard to impacts upon local air quality from NO_2 and PM_{10} are not necessary. The total background – adjusted emission rates for both NO_2 and PM_{10} are below the threshold emission rate for a 20m effective stack height.

OMAGH COLLEGE

The following information has been provided with regard for the two biomass boilers operating at Omagh College.

As there is more than one stack a precautionary approach has been taken whereby it is assumed that the total emissions are emitted from a single stack.

- Biomass installations are 150kw and 250 kw wood chip wood burners
- Stack Height = 18m
- Stack Diameter = 0.3m
- Exit Velocity = $6.2ms^{-1}$
- PM_{10} Emission Rate = *240g/GJ
- NO_2 Emission rate = *150g/GJ

*In accordance with the technical guidance default emission factor for NO_2/PM_{10} has been used to calculate the maximum emission rate (EMEP/CORINAIR Guidebook 2007

(i) Max. PM_{10} Emission Rate 250kw = $240g/GJ \times 250kw \times 10^{-6} = 0.06g/s$
Max. PM_{10} Emission Rate 150kw = $240g/GJ \times 150kw \times 10^{-6} = 0.036g/s$
Max. PM_{10} Emission Rate (Combined) = 0.06g/s + 0.036g/s = 0.096g/s

(ii) Max NO_2 Emission Rate 250Kw = $150g/GJ \times 250kw \times 10^{-6} = 0.0375g/s$
Max NO_2 Emission Rate 150Kw = $150g/GJ \times 150kw \times 10^{-6} = 0.0225g/s$
Max NO_2 Emission Rate (Combined) = 0.0375g/s + 0.0225g/s = 0.06g/s

Background concentrations for 2008 of both PM_{10} and NO_2 have been obtained from the Air Quality Archive 1 x 1 km background maps for the grid square centred at 245500, 373500:

Background PM_{10} (2008) = $15.5mg/m^3$
Background NO_2 (2008) = $8.7\ mg/m^3$

'Background-adjusted' emission rates (E_A) are calculated using the following formula, to assess the potential impacts of the biomass burner with regards to the Air Quality Strategy 24-hours mean objective for PM_{10} and the annual mean objective for NO_2 respectively, where E is the emission rate in g/s for the plant at operating capacity, and G is the annual average background concentration in mg/m^3 is calculated as:

$PM_{10}E_A$ 250 kw = $E/(32-G) = 0.06g/s / (32\mu g/m^3 - 15.5\mu g/m^3) = 0.00363g/s$
$= 3.63 \times 10^{-3} g/s$

$PM_{10}E_A$ 150 kw = $E/(32-G) = 0.036g/s / (32\mu g/m^3 - 15.5\mu g/m^3) = 0.00218g/s$
$= 2.2 \times 10^{-3} g/s$

$PM_{10}E_A$ (combined) = $E/(32-G) = 0.096g/s / (32\mu g/m^3 - 15\mu g/m^3) = 0.00581g/s$
$= 5.81 \times 10^{-3} g/s$

NO_2E_A 250kw = E/(40-G) = 0.0375g/s/ (40µg -8.7µg/m^3) = 0.00119g/s
= 1.2 x 10^{-3}g/s

NO_2E_A 150kw = E/(40-G) = 0.0225g/s/ (40µg -8.7µg/m^3) = 0.000718g/s
= 7.2 x 10^{-4}g/s

NO_2E_A (combined) = E/(40-G) = 0.06g/s/ (40µg -8.7µg/m^3) = 0.0191g/s
= 1.9 x 10^{-3}g/s

1. 32µg/m^3 represents the annual average concentration at which given a typical distribution of concentrations, with time the 90th percentile of the 24 hour means will exceed the objective.

2. 40µg/m^3 represents the annual mean objective.

The table below shows the minimum effective stack height, below which further assessment of the boiler may be required. For the NO_2 annual mean objective, the effective stack height would have to be < 1 metre for further assessment to be considered. For the 24 hour mean objective for PM_{10} the effective chimney height would have to be 12m or below for further assessment to be considered.

POLLUTANT	NO_2	PM_{10}
AIR QUALITY OBJECTIVE	ANNUAL MEAN	24-HOUR
Emission factor (g/s)(default value)	150	240
Maximum Emission rate (g/s)	0.06	0.096
2008 Background Concentration (µg/m^3)	8.7	15.5
2008 Background-Adjusted Emission Rate (g/s)	0.0019	0.0058
A Minimum Effective Stack Height (m)	<1	12
B Threshold Background adjusted Emission rate for 18m Stack (g/s)	0.045	0.018

Note A Minimum effective stack height below which further assessment may be required (derived from nomograms Fg 5.19 Technical Guidance LAQM TG(09)

B Threshold background – adjusted emission rate for a 18m stack above which further assessment of the boiler may be required.

Omagh District Council has assessed the biomass boilers currently operating within the district and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Omagh District Council confirms that there are no areas of high density biomass combustion plants in the district.

6.3 Domestic Solid-Fuel Burning

Omagh District Council proceeded directly to a 3rd stage review and assessment in respect of SO_2 and PM_{10} from domestic fuel consumption in the five 1km x 1km grid

squares identified in Stage 1. This involved detailed modelling of domestic fuel emissions. A Fuel Use survey was carried out to provide estimates of PM_{10} and SO_2 emissions required for the modelling. Modelling predicted that there would be no exceedances of the SO_2 objective levels.

Omagh District Council has assessed areas of significant domestic solid fuel use and concluded that it will not be necessary to proceed to a Detailed Assessment for sulphur dioxide.

7 Fugitive or Uncontrolled Sources

Omagh District Council confirms that there are no potential sources of fugitive particulate matter emissions in the District.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Monitoring of NO_2 has been undertaken at three locations using passive diffusion tubes. National bias adjustment factors have been used to adjust the annual mean. The monitoring results have indicated that there have been no exceedances of the 40ugm^{-3} annual mean within the period of monitoring.

8.2 Conclusions from Assessment of Sources

No new or significantly changed sources have been identified and therefore it is not considered necessary to proceed to detailed assessment.

8.3 Proposed Actions

The Updating and Screening Assessment has not identified the need to proceed to a Detailed Assessment for any pollutant and therefore the proposed action is to carry out and submit a Progress Report in 2010.

9 References

1) Defra (2009) Local Air Quality Management, Technical Guidance LAQM.TG (09)

2) AEA Energy & Environment (2008) Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users, AEA/ENV/R/2504 – Issue 1a

3) AEA Energy & Environment (2009) Technical Guidance: Screening Assessment for Biomass Boilers.

4) Air Quality Archive (http://www.airquality.co.uk/archive/index.php)

Appendices

Appendix A: QA/QC Data

Appendix B: Map indicating Location of NO_2 Diffusion Tubes

Appendix C: Map indicating Location of Biomass Boiler at Omagh Leisure Centre

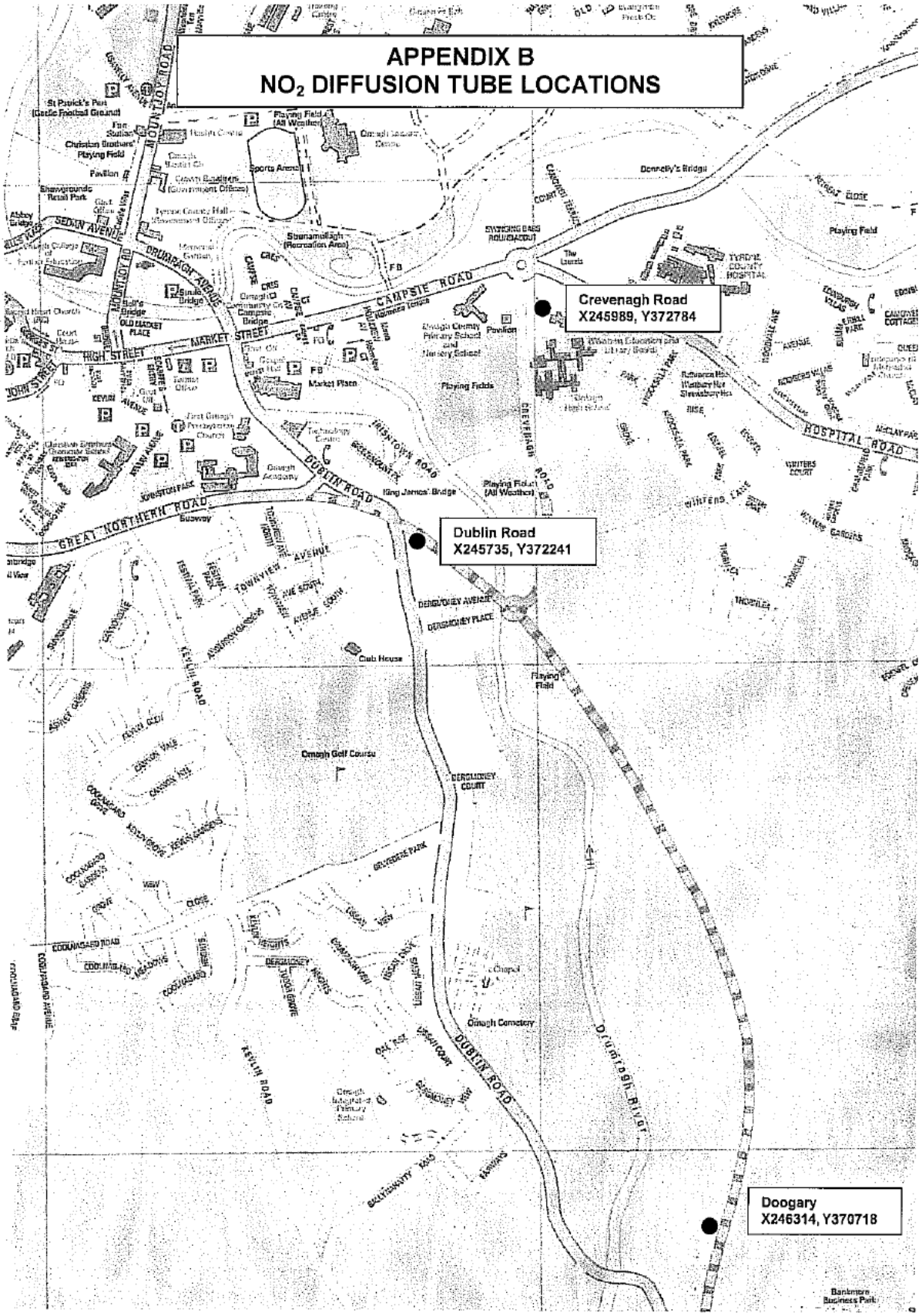
Appendix D: Map indicating Location of Biomass Boiler at Omagh College

Appendix A:

Diffusion Tube QA/QC Information:

- The NO_2 diffusion tubes are supplied by Envirotechnology plc.
- They are Gradko tubes and the preparation method is 20%TEA in water.
- The Gradko laboratory which Envirotechnology use for analysis is NAMAS accredited and complies with the requirements of the Workplace Analysis Scheme for Proficiency.
- The review and assessment website indicates they are of 'good precision' and that the following bias adjustment factor of 0.9 should be applied for **2008**.

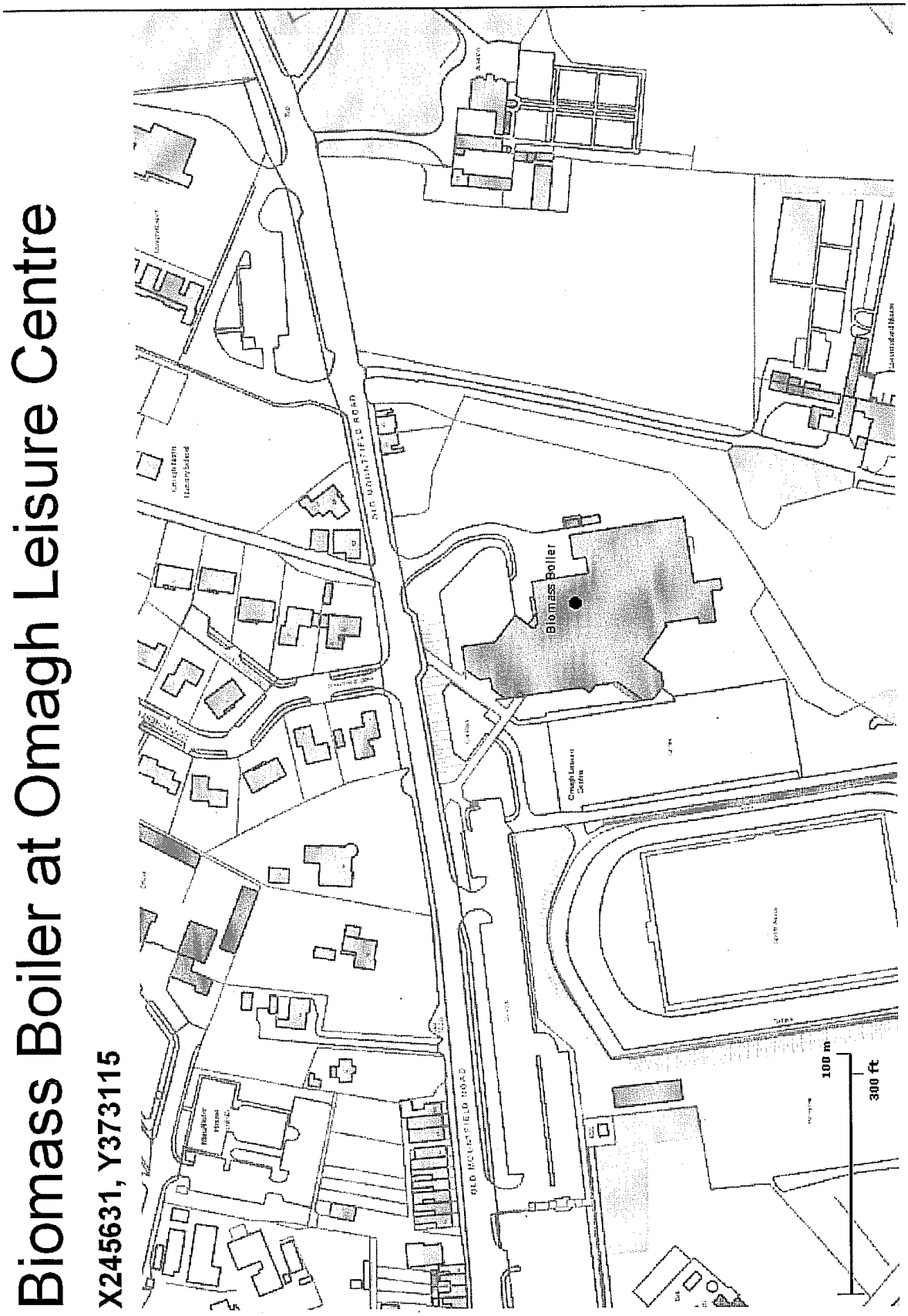
APPENDIX B
NO_2 DIFFUSION TUBE LOCATIONS



APPENDIX C:

Biomass Boiler at Omagh Leisure Centre

X245631, Y373115



APPENDIX D:

Biomass Boiler at Omagh College

X245037, Y372839