Cookstown
DISTRICT COUNCIL
COMHAIRLE CHEANTAR NA COIRRE CRÍOCHAÍ
DISTRICK COONCIL O COOKESTOUM

2012 AIR QUALITY UPDATING AND SCREENING ASSESSMENT for COOKSTOWN DISTRICT COUNCIL

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

December 2012

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Executive Summary

Local Air Quality Management by Local Authorities was introduced as a Statutory Duty by the Environment (Northern Ireland) Order 2002, and subsequent Regulations. Under this legislation District Councils are required to review the present quality of air, and the likely future quality of air to assess whether the nationally presented objectives are likely to be achieved.

The first stage of Cookstown District Councils Review and assessment of air quality was published in August 2001. This was followed by the second and third stage Review and Assessment published in 2004, which scrutinized three pollutants which were potentially of concern, namely nitrogen dioxide, sulphur dioxide and particulates. This report concluded that it was unlikely that the air quality objectives would be exceeded, and that it was not necessary for Cookstown District Council to declare any Air Quality Management Areas.

Automatic monitoring was undertaken for Sulphur Dioxide and PM10 from 2006 until 2011. The results for these pollutants were found to be consistently well within the air quality objectives, and the automatic monitoring station was decommissioned in July 2011. The Council continues to monitor for Nitrogen dioxide using passive diffusion tubes at a number of sites throughout the District.

This Updating and Screening Report looks at any changes that may have occurred since the First Stage Review which may have affected the seven presented pollutants, and identifies if more detailed assessments are required. The Updating and Screening Assessment has concluded that for each of the seven key air pollutants the air quality objectives are likely to be met and that a more detailed assessment is not required.

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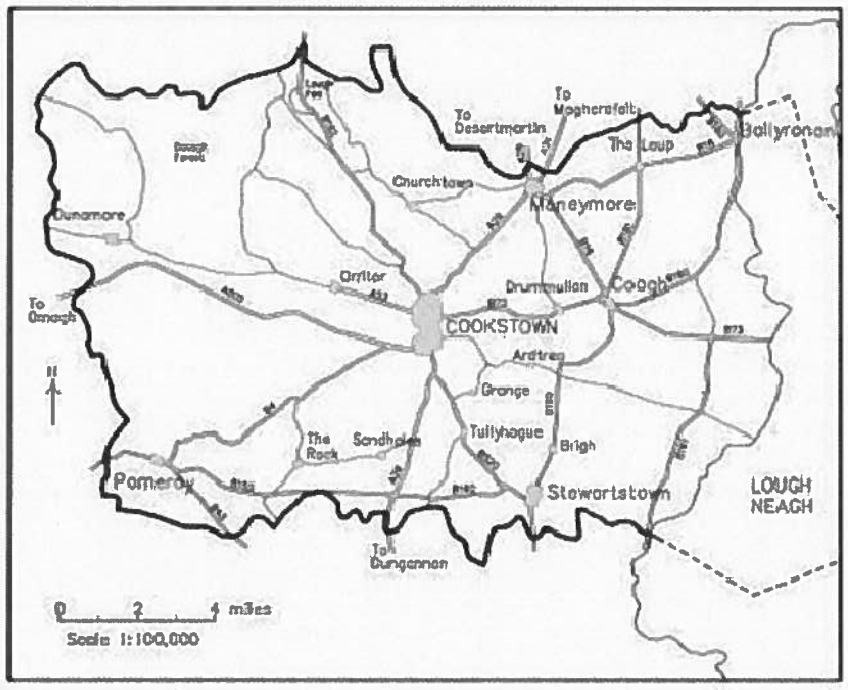
1 Introduction

1.1 Description of Local Authority Area

The Cookstown District Council area is situated in the central Mid-Ulster area of Northern Ireland. It shares it boundaries with Magherafelt District Council to the north, Omagh District Council to the west, and Dungannon and South Tyrone Borough Council to the south. Its eastern boundary is the shoreline of Lough Neagh. The area has a population of 32,000 and covers 235 square miles. Much of the population of the District is located in the town of Cookstown which is central to the area. There are also a number of rural villages in the district, Moneymore, Stewartstown, Coagh, Ardboe and Pomeroy.

The area is easily accessible and is a convenient distance from Northern Ireland's two main motorways, the M1 and M2. The main A29 north-south route bisects the district. The major airports and harbours in Northern Ireland are all within 1 hour's drive of Cookstown. Agriculture and the agri-food business are strong contributors to the areas economy. However, the district also boasts a number of key industrial employers.

Fig. 1.1 – Map showing Cookstown District Council area.



1.2 Purpose of Report

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

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

1.3 Air Quality Objectives

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

The cornerstone of the LAQM process is the Review and Assessment of Air Quality. This is a statutorily required process whereby local air quality monitoring and modelling results are compared to the national air quality standards and objectives (see Appendix 2). Where objectives are breached or are predicted to be breached, an Air Quality Management Area (AQMA) is declared. An Action Plan must then be produced stating how the district council will drive air quality towards the objective.

The first round review and assessment of air quality was completed in 2004. It involved a 3-stage approach, the findings of which are contained in two reports:

Table 1.2
SUMMARY OF FIRST STAGE REVIEW AND ASSESSMENT IN COOKSTOWN

Pollutant	Significant Sources	Recommendations
Carbon Monoxide	No significant Sources	No further assessment
Benzene	No significant Sources	No further assessment
1–3 Butadiene	No significant Sources	No further assessment
Lead	No significant sources	No further assessment
Nitrogen Dioxide	• Four single carriageway road junctions exceeding average threshold • Two dual carriageway junctions exceeding 10,000 vpd and sensitive properties within 10 metres • Three dual carriageway sections exceeding 10,000 vpd and sensitive properties within 10m • One Part A process in Cookstown	Proceed to 2nd stage
Sulphur Dioxide	• One Part A process • One Thermal combustion system • At least 2 1x1km grid squares with potentially more than 300 houses burning coal	Proceed to 2nd stage
PM_{10}	• At least 16 sections of single carriageway roads and 7 road junctions exceeding 5000 vehicles per day and with sensitive properties within 2m (single carriageway) or 10m (dual carriageway) • Four dual carriageway sections exceeds 5000 vpd with sensitive	Proceed to 2nd stage

	properties within 10 metres • One significant Part A process	

(2) 2nd/3rd Stage Review and Assessment Report – August 2004.

Conclusions and Recommendations of the 2nd/3rd Stage Report are given below.

• Air quality objectives for SO2 and PM10 are likely to be met and therefore there is no need to designate an air quality management area for these pollutants.

• Existing monitoring of the SO2 and PM10 will continue using real-time analysers, in order to provide data to verify the detailed dispersion modelling predictions resulting in the above conclusions.

• Air quality objectives for NO2 are expected to be met at locations of relevant public exposure i.e. building facades of residential properties, despite exceedances of the annual mean objective at three kerbside sites. An air quality management area for NO2 is therefore not being designated for this pollutant.

• Predicted concentrations of NO2 at a number of building facades of residential properties are close, but not exceeding air quality objectives. Further monitoring of NO2 will be carried out using diffusion tubes. These will be located on the facades of residential properties closest to the kerbside sites where exceedances of the NO2 annual mean objective have been identified.

3) Update And Screening Assessment Report August 2006

Table 1.3 SUMMARY FINDINGS OF UPDATE AND SCREENING ASSESSMENT IN COOKSTOWN

Pollutant	Conclusion	Recommendation
Carbon Monoxide	The objective for CO is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Carbon Monoxide.
Benzene	The objective for Benzene is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Benzene.
1 – 3 Butadiene	The objective for 1-3 Butadiene is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for 1-3 Butadiene.
Lead	The objective for lead is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Lead.
Nitrogen Dioxide	The assessment indicated that the conclusion drawn from the 1st round of review and assessment remains valid, and has indicated that the annual menu and hourly objective for Nitrogen Dioxide are unlikely to be exceeded.	There is no need to undertake a detailed assessment for Nitrogen Dioxide.
Particulate Matter PM_{10}	The assessment has indicated that both the daily and the annual mean for particulate matter are unlikely to be exceeded at any location in Cookstown area.	There is no need to undertake a detailed assessment for PM_{10}
Sulphur Dioxide SO_2	The assessment has indicated that both the annual mean and hourly objective 15 minute mean for Sulphur Dioxide are unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Sulphur Dioxide.

4) Update And Screening Assessment Report 2009

Table 1.4 SUMMARY FINDINGS OF UPDATE AND SCREENING ASSESSMENT IN COOKSTOWN

Pollutant	Conclusion	Recommendation
Carbon Monoxide	The objective for CO is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Carbon Monoxide.
Benzene	The objective for Benzene is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Benzene.
1 – 3 Butadiene	The objective for 1-3 Butadiene is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for 1-3 Butadiene.
Lead	The objective for lead is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Lead.
Nitrogen Dioxide	The assessment indicated that the conclusion drawn from the 1st round of review and assessment remains valid, and has indicated that the annual menu and hourly objective for Nitrogen Dioxide are unlikely to be exceeded.	There is no need to undertake a detailed assessment for Nitrogen Dioxide.
Particulate Matter PM_{10}	The assessment has indicated that both the daily and the annual mean for particulate matter are unlikely to be exceeded at any location in Cookstown area.	There is no need to undertake a detailed assessment for PM_{10}
Sulphur Dioxide SO_2	The assessment has indicated that both the annual mean and hourly objective 15 minute mean for Sulphur Dioxide are unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Sulphur Dioxide.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Automatic monitoring was carried out in the District for both PM10 and Sulphur dioxide from December 2003 to July 2011. The PM10 was monitored by a TEOM series 1400a ambient particulate monitor. The Sulphur dioxide was monitored using a Monitor Europe ML 9805B Sulphur dioxide analyser. Both of these were housed within a secure site at Gortalowry House, Church Street, Cookstown. The site was chosen because it was within the 1 x 1km grid square identified in the Stage 1 Risk and Assessment Report as having the highest concentration of coal burning properties in the Cookstown District. No other sites have started up since the previous assessment.

Results throughout the period of monitoring were consistently well below Air Quality Objectives. It was felt that after six and a half years of monitoring it was not cost effective to continue with the monitoring programme, and the station was decommissioned in July 2011. Cookstown DC has not monitored for PM10 or Sulphur dioxide since this date.

2.1.2 Non-Automatic Monitoring Sites

The Council monitors Nitrogen dioxide at 8 sites around the district using passive diffusion tubes. Diffusion tubes represent a simple and cost-effective method of monitoring air quality in an area, to give a good general indication of average pollution concentrations. They are particularly useful for assessment against annual mean objectives.

Monitoring sites are chosen to provide data on locations that are likely to give a worst case scenario of air quality in this particular area. These should be representative of likely residential exposure and, where possible, are close to the nearest receptor from the busy road or road junction of interest. The sites are subject to periodic review and where sufficient data has been gathered, some of the diffusion tubes are relocated to new locations.

Map (s) of Non-Automatic Monitoring Sites (if applicable)

Figure 2.1 Map Showing Monitoring Locations in Moneymore (Z1, Z8, Z9, Z10)

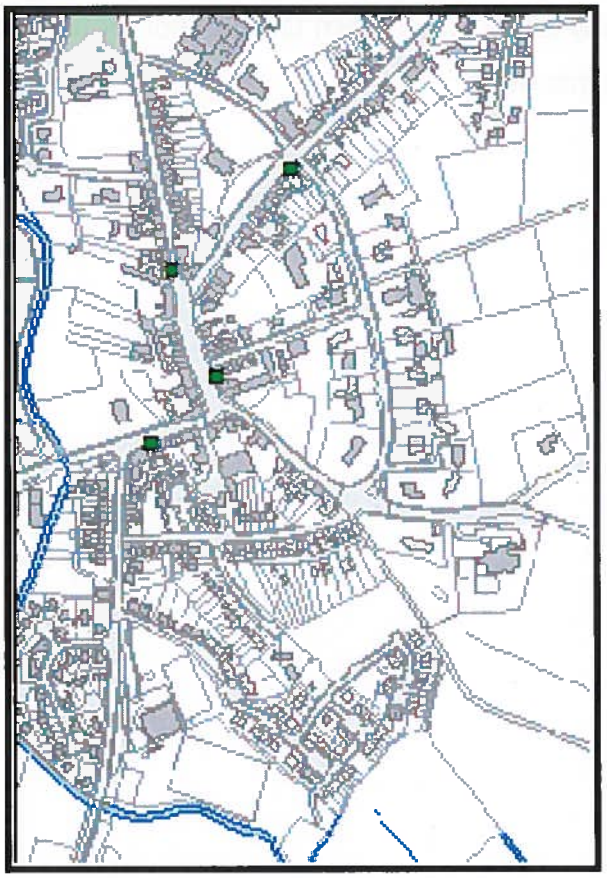


Fig 2.2 Map Showing Monitoring Location at William Street, Cookstown (Z2)

Fig 2.3 Map Showing Monitoring Location at James Street, Cookstown (Z3)

Fig 2.4 Map Showing Monitoring Location at Church Street, Cookstown (Z4)

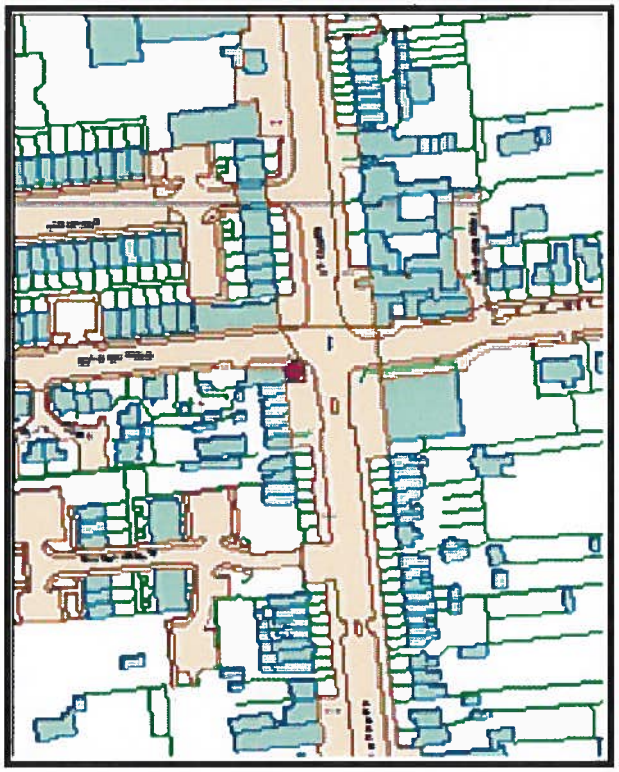


Fig 2.5 Map Showing Monitoring Location at Killymoon Street, Cookstown (Z5)

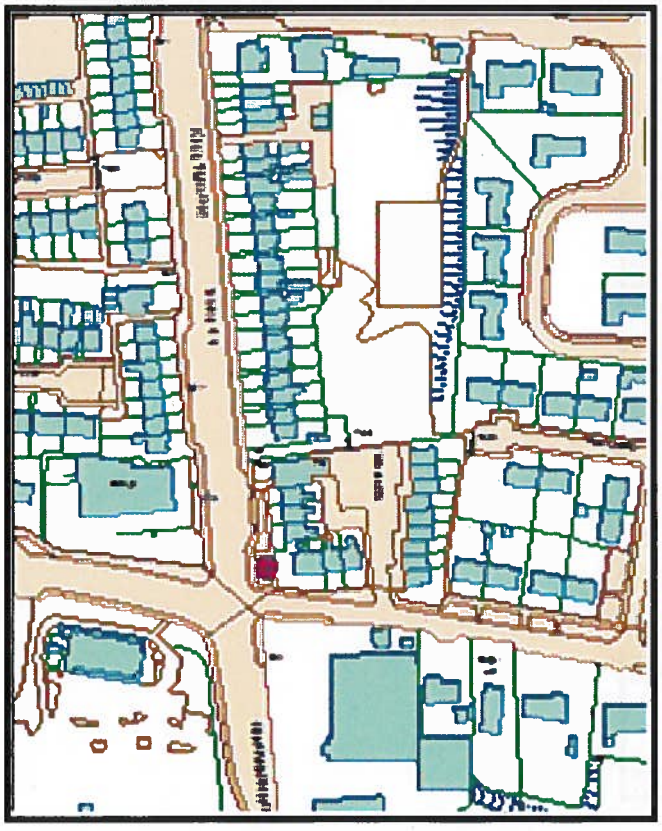


Table 2.1 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutant	In AQMA?	Monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure	Distance to kerb of nearest road	worst-case
Z1	Roadside	285770	383510	NO2	No	No	Y	<1m	Y
Z2	Kerbside	281071	378445	NO2	No	No	Y	6m	Y
Z3	Roadside	281053	378197	NO2	No	No	Y	7m	Y
Z4	Kerbside	281121	377537	NO2	No	No	Y	<1m	Y
Z5	Kerbside	281225	376939	NO2	No	No	Y	7m	Y
Z8	Kerbside	285813	383458	NO2	No	No	Y	3m	Y
Z9	Kerbside	285779	383446	NO2	No	No	Y	4m	Y
Z10	Kerbside	285759	383333	NO2	No	No	Y	5m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Diffusion Tube Monitoring Data

The Council is currently monitoring nitrogen dioxide at 8 sites around the district using passive diffusion tubes. Diffusion tubes represent a simple and cost-effective method of monitoring air quality in an area, to give a good general indication of average pollution concentrations. They are particularly useful for assessment against annual mean objectives.

Monitoring sites are chosen to provide data on locations that appear to be representative of likely residential exposure and, where possible, are close to the nearest receptor from the busy road or road junction of interest. The sites are subject to periodic review and where sufficient data has been gathered, some of the diffusion tubes are relocated to new locations. The tubes have all been located at their current positions since 2010 when the number of tubes in Moneymore was increased to four and two of the existing three tubes relocated to give more representative data.

Table 2.2 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA?	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.9) 2011 (µg/m^3)
Z1	Lawford St, Moneymore	Roadside	N	100	N/A	N	31.6
Z2	William Street, Cookstown	Kerbside	N	92.5	N/A	N	28.8
Z3	James Street, Cookstown	Roadside	N	100	N/A	N	33.3

Site ID	Location	Site Type	Within AQMA?	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.9) 2011 (µg/m^3)
Z4	Church Street, Cookstown	Kerbside	N	100	N/A	N	29.6
Z5	Killymoon Street, Cookstown	Kerbside	N	100	N/A	N	31.1
Z8	Smith Street, Moneymore	Kerbside	N	100	N/A	N	26.0
Z9	High Street, Moneymore	Kerbside	N	100	N/A	N	19.4
Z10	Stonard Street, Moneymore	Kerbside	N	100	N/A	N	32.4

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes (2009 to 2011)

Site ID	Location	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m3		
			2009	2010	2011
Z1	Lawford St, Moneymore	N	37.9	37.9	31.6
Z2	William Street, Cookstown	N	31.5	31.6	28.8
Z3	James Street, Cookstown	N	39.6	39.7	33.3
Z4	Church Street, Cookstown	N	39.6	32.8	29.6
Z5	Killymoon Street, Cookstown	N	35.9	36.0	31.1
Z8	Smith Street, Moneymore	N	N/A	28.3	26.0
Z9	High Street, Moneymore	N	N/A	20.8	19.4
Z10	Stonard Street, Moneymore	N	N/A	39.8	32.4

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 2011 figure for Gradko Laboratories and the 20% TEA method in water was 0.90. This is based on 41 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

As can be seen from the results listed in Table 2.5 the bias adjusted factors were well below the air quality objective of
40 ugm-3. As a result of this, the department does not intend to declare an AQMA based on this result. When compared to the previous two years the results would seem to be slightly down for all of the monitoring points, although whether this was just a one off or part of a longer term trend is not yet clear.

2.2.2 PM_{10}

Cookstown District Council does not monitor for PM10 within the district.

2.2.3 Sulphur Dioxide

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

2.2.4 Benzene

Cookstown District Council does not monitor for Benzene within the district.

2.2.5 Other pollutants monitored

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

2.2.6 Summary of Compliance with AQS Objectives

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

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Cookstown 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

Cookstown 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.

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

3.4 Junctions

Cookstown 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

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

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

Cookstown District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Cookstown District Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

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

4.2.2 Moving Trains

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

4.3 Ports (Shipping)

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

5 Industrial Sources

5.1 Industrial Installations

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

Cookstown 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

Cookstown 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

Cookstown 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 Cookstown District Council area.

5.3 Petrol Stations

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

5.4 Poultry Farms

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

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Cookstown District Council has previously assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Cookstown District Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Cookstown District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

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

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Cookstown District Council has no Air Quality Management Areas currently declared in the District. Air quality monitoring data for the 2011 year does not indicate the need to declare an AQMA at this time.

8.2 Conclusions from Assessment of Sources

The assessment of new and existing sources did not identify any potential exceedences of air quality objectives in the district. This department does not therefore intend to conduct detailed assessments or declare any AQMA's based on the assessment of these sources.

8.3 Proposed Actions

This Updating and Screening Assessment has not identified the need to proceed to a detailed assessment for any pollutant. This department's next course of action is to submit a Progress Report in 2013.

9 References

Publications

1.. The Environment (Northern Ireland) Order 2002

2. Air Quality Regulations (Northern Ireland) 2003

3. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000

4. DEFRA Local Air Quality Management Technical Guidance LAQM.TG(09)

5. Cookstown District Council 1st Stage Review and Assessment - August 2001

6. Cookstown District Council 2nd/3rd Stage Review and Assessment Report- August 2004

7. Cookstown District Council – Updating and Screening Assessment – August 2006

8. Cookstown District Council Progress Report - 2007

9. Cookstown District Council Progress Report – 2008

Websites

1.Northern Ireland Air Quality Website –

http://www.airqualityni.co.uk/

2. DEFRA website-

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

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The diffusion tube analysis for the Council in 2011 was carried out by Gradko International, Wincester, 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 2011 figure for Gradko Laboratories and the 20% TEA method in water was 0.90. This is based on 41 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://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube290909.xls

Factor from Local Co-location Studies (if available)

This factor is not available in the Cookstown District.

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 0.90 as this was

representative of 41 separate co-location studies and was thought to represent a good 'average' figure.