



2013 Air Quality Progress Report for The Moray Council

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

May, 2013

TSI Scotland

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Executive Summary

The Local Air Quality Management process as set out in Part IV of the Environment Act (1995) (Ref.1) and the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (Ref.2) requires all local authorities to complete a Progress Report due for submission in April 2013 in accordance with technical guidance LAQM.TG(09) (Ref.3). The progress report is intended to maintain continuity in the Local Air Quality Management (LAQM) process, and fill in the gaps between the three-yearly cycle of Review and Assessment.

This is the 2013 Progress Report for The Moray Council which identifies all matters regarding impacts to local air quality that are new or have changed since the Updating and Screening Assessment Report in 2012 (Ref.4) and whether further consideration of such changes is required.

The Air Quality Strategy (AQS) details objective concentrations for the following pollutants:

- Benzene
- 1,3-Butadiene
- Carbon Monoxide (CO)
- Lead
- Sulphur Dioxide (SO₂)
- Nitrogen Dioxide (NO₂)
- Particles (PM₁₀)

The results of the monitoring programme across The Moray Council are as follows:

- Diffusion tube results indicate that annual average concentrations of NO₂ are below the AQS annual mean objective of 40µg/m³ at all monitoring locations. The maximum recorded annual mean concentration was 28.8µg/m³ in Moss Street Keith.

- There is a general downward trend in annual mean NO₂ concentrations across the diffusion tube network. The concentration has decreased at 13 out of 17 sites between 2011 and 2012. There was a moderate increase at 3 Elgin sites and at one of the Keith sites, however, the annual mean remains considerably below the limit of 40µg/m³ at all locations.
- There is a significant reduction in concentration in Fochabers High Street from between 30-37µg/m³ in recent years to 12.2µg/m³ in 2012 which is likely to be due to the opening of the Bypass during 2012, significantly reducing traffic flow in Fochabers High Street.

A review of planning applications submitted in 2012 showed that there were no new commercial or residential developments likely to result in any exceedences of the AQS objectives for any pollutant.

Consultation with SEPA has confirmed that there are no new or significantly changed industrial sources likely to result in an exceedence of any AQS objectives for any pollutant.

The Moray Council Transportation Section confirmed that there were no new road developments with the potential to result in an exceedence of the AQS objectives. For the majority of roads monitored in Elgin, the Annual Average Daily Traffic (AADT) count has increased slightly between 2011 to 2012 but there have been some reductions.

Transport Scotland was consulted regarding the AADT figures for the main trunk roads, the A95 and A96 within the Moray Council area. The AADT flows have decreased on 9 out of 16 of the road links between 2011 and 2012. The maximum increase is 8% on the A96 north of Keith. The 80% reduction in traffic flow on the A96 Mosstodloch is due to the complete opening of the new Bypass in 2012. It is not expected that there will be any exceedences of the NAQS objectives at nearby receptors due to changes in traffic flow on the trunk roads.

There are proposals for a new Western Link Road linking the A96 to the west of Elgin. The proposed scheme will result in an increase in traffic flow on some roads, but a decrease on others. An Air Quality Impact Assessment has been requested by The Moray Council Environmental Health Section to be submitted with the planning application. The results of this will be discussed in a future report.

No other new or significantly changed roads were identified.

It is concluded that The Moray Council is not required to proceed to a Detailed Assessment for any pollutant.

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1 Introduction

1.1 Description of Local Authority Area

The Moray Council area is located in the north-east of Scotland between the main cities of Inverness and Aberdeen. It is bordered by The Highland Council area to the west and by Aberdeenshire Council to the south and east. The northern border of the Moray Council area is the coastline of the Moray Firth.

Topographically, the area is dominated by the Glens of the Grampian Mountain Range including large areas of forest and moorland to the south. The northern area is relatively flat with large expanses of agricultural land and coastal grassland.

The population of the Moray Council area is approximately 88,000 with the majority of residents living in the towns of Elgin, Forres, Fochabers, Keith, Buckie, Aberlour and Lossiemouth. The main industries are distilling, food processing and traditional farming, forestry and fishing. The former RAF base in Kinloss is now an army barracks with minimal flight movements while RAF Lossiemouth site is still operational as a Typhoon flight centre.

There is a mainline passenger rail route passing through the north of the area that runs between Inverness and Aberdeen and the main Trunk Roads are the A96, which passes through Elgin and the A95 which passes through Keith, Craigellachie and Aberlour. The construction of the A96 Fochabers and Mosstodloch Bypass was complete and fully opened in 2012.

The Moray Council boundary is shown in Figure 1.1

Figure 1.1 Map of The Moray Council Area



1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), 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.

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 Local Air Quality Management 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 **Scotland** are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297), 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, 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 Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	3.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particulate Matter (PM₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Table 1.2 summarises the Air Quality Review and Assessment reports submitted by The Moray Council since 2003 with the most recent report of 2012 listed first.

Table 1.2 Summary of Previous Air Quality Review and Assessment Reports 2003-2012

Report	Date Completed	Summary and Conclusions
Updating and Screening Assessment (Ref.4)	April 2012	No predicted exceedences of AQS Objectives
Progress Report (Ref.5)	June 2011	No predicted exceedences of AQS Objectives
Progress Report (Ref.6)	May 2010	No predicted exceedences of AQS Objectives
Updating and Screening Assessment (Ref.7)	May 2009	No predicted exceedences of AQS Objectives
Progress Report (Ref.8)	April 2008	No predicted exceedences of AQS Objectives
Progress Report (Ref.9)	May 2007	No predicted exceedences of AQS Objectives
Updating and Screening Assessment (Ref.10)	June 2006	No predicted exceedences of AQS Objectives
Detailed Assessment of Road Traffic Particulate Emissions (Ref.11)	August 2005	Assessment of short-term monitoring data and modelled road traffic emissions concluded that it was unlikely that there would be an exceedence of the PM ₁₀ objectives
Progress Report (Ref.12)	May 2005	No predicted exceedences of AQS Objectives
Air Quality Study in the Vicinity of RAF Kinloss and Lossiemouth (Ref.13)	November 2004	No identified exceedences of the AQS Objectives or Odour Threshold Values
Updating & Screening Assessment Supplementary Report (Ref.14)	January 2004	No further assessment of domestic fuel burning or quarries required. Relevant public exposure to PM ₁₀ identified at 2 road junctions
Updating & Screening Assessment (Ref.15)	May 2003	Additional information on domestic fuel burning and quarry emissions required. DMRB screening tool identified requirement for assessment of PM ₁₀ at 3 busy junctions

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

Monitoring is carried out for NO₂ within The Moray Council. During 2012, NO₂ was monitored at 17 locations using passive diffusion tubes. There is no other monitoring undertaken for any other pollutant.

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites within The Moray Council.

2.1.2 Non-Automatic Monitoring Sites

Non-automatic monitoring of NO₂ was undertaken at 17 locations within The Moray Council in 2012 using passive diffusion tubes. The location and description of each site is shown in Table 2.1. The sites are classified as a mixture of kerbside, roadside and urban background sites. Maps showing the locations of the monitoring sites are shown in Figures 2.1-2.7.

The tubes are provided and analysed by Aberdeen Scientific Services using 20% TEA in Acetone and are changed on a monthly basis by Moray Council personnel. The data capture was above 90% for 13 out of 17 sites. The QA/QC procedures for diffusion tube analysis are included in more detail in Appendix A.

Table 2.1 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?
DT1	Lamp Post West Park Court-Elgin	Kerbside	321105	862669	2.8	NO ₂	N	N	Y (<5m)	1m	Y
DT2	Junction East & Maisondieu Rd-Elgin	Kerbside	322348	862745	3	NO ₂	N	N	Y (<2m)	1m	Y
DT3	99-101 Maisondieu Road-Elgin	Roadside	322302	862727	3	NO ₂	N	N	Y (<5m)	2m	Y
DT4	26-28 Priory Place-Elgin	Urban Background	322249	862630	2.8	NO ₂	N	N	Y (<5m)	N/A	N
DT5	Main Street New Elgin	Kerbside	322233	861869	3	NO ₂	N	N	Y (<5m)	1m	Y
DT6	Queen Street Roundabout-Elgint	Kerbside	322029	862832	3	NO ₂	N	N	Y (<5m)	1m	Y
DT7	Hay Street-Elgin	Roadside	321615	862307	2.3	NO ₂	N	N	Y (<5m)	2m	Y
DT8	Newmill Road-Elgin	Roadside	322492	863309	3	NO ₂	N	N	Y (<5m)	2m	Y

The Moray Council

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?
DT9	50A High Street-Fochabers	Kerbside	334423	858663	3	NO ₂	N	N	Y (<2m)	2m	Y
DT10	Sunndach George Street-Fochabers	Urban Background	303726	858931	3	NO ₂	N	N	Y (<2m)	N/A	N
DT11	Tolbooth, High Street-Forres	Roadside	343323	850458	3	NO ₂	N	N	Y (<5m)	2m	Y
DT12	106 Moss Street-Keith	Kerbside	343329	850415	2.8	NO ₂	N	N	Y (<5m)	2m	Y
DT13	87 Moss Street-Keith	Kerbside	322463	870293	3.1	NO ₂	N	N	Y (<5m)	2m	Y
DT14	1 Merryton Court-Lossiemouth	Urban Background	323515	870931	3	NO ₂	N	N	Y (<2m)	N/A	N
DT15	7 James Street-Lossiemouth	Kerbside	327756	849658	3	NO ₂	N	N	Y (<2m)	1m	Y
DT16	New Street-Rothies	Roadside	327740	849239	3	NO ₂	N	N	Y (<5m)	2m	Y
DT17	New Street-Rothies	Roadside	334423	858663	3	NO ₂	N	N	Y (<5m)	2m	Y

Figure 2.1 Map of All Non-Automatic Monitoring Sites

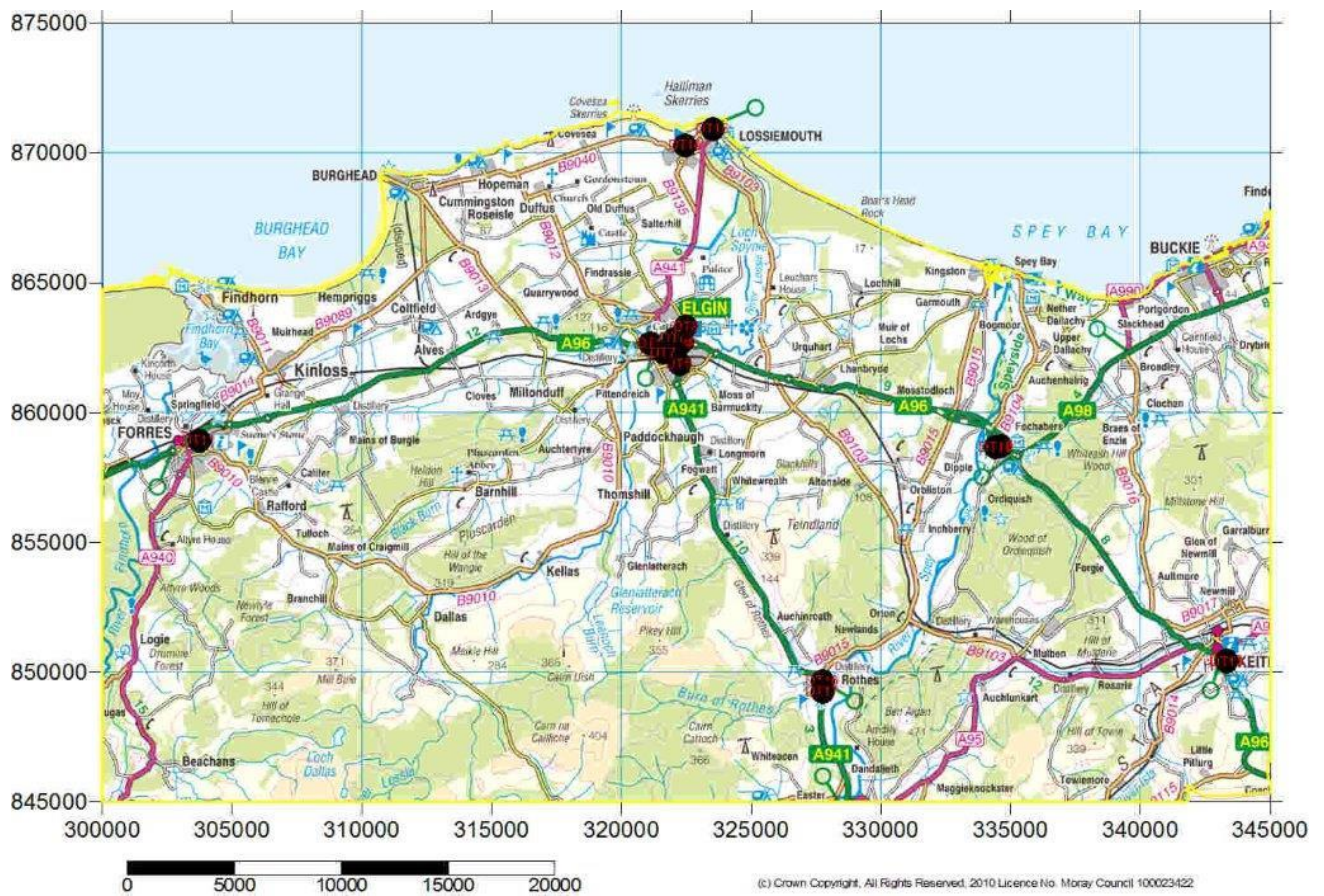


Figure 2.2 Elgin NO₂ Monitoring Sites

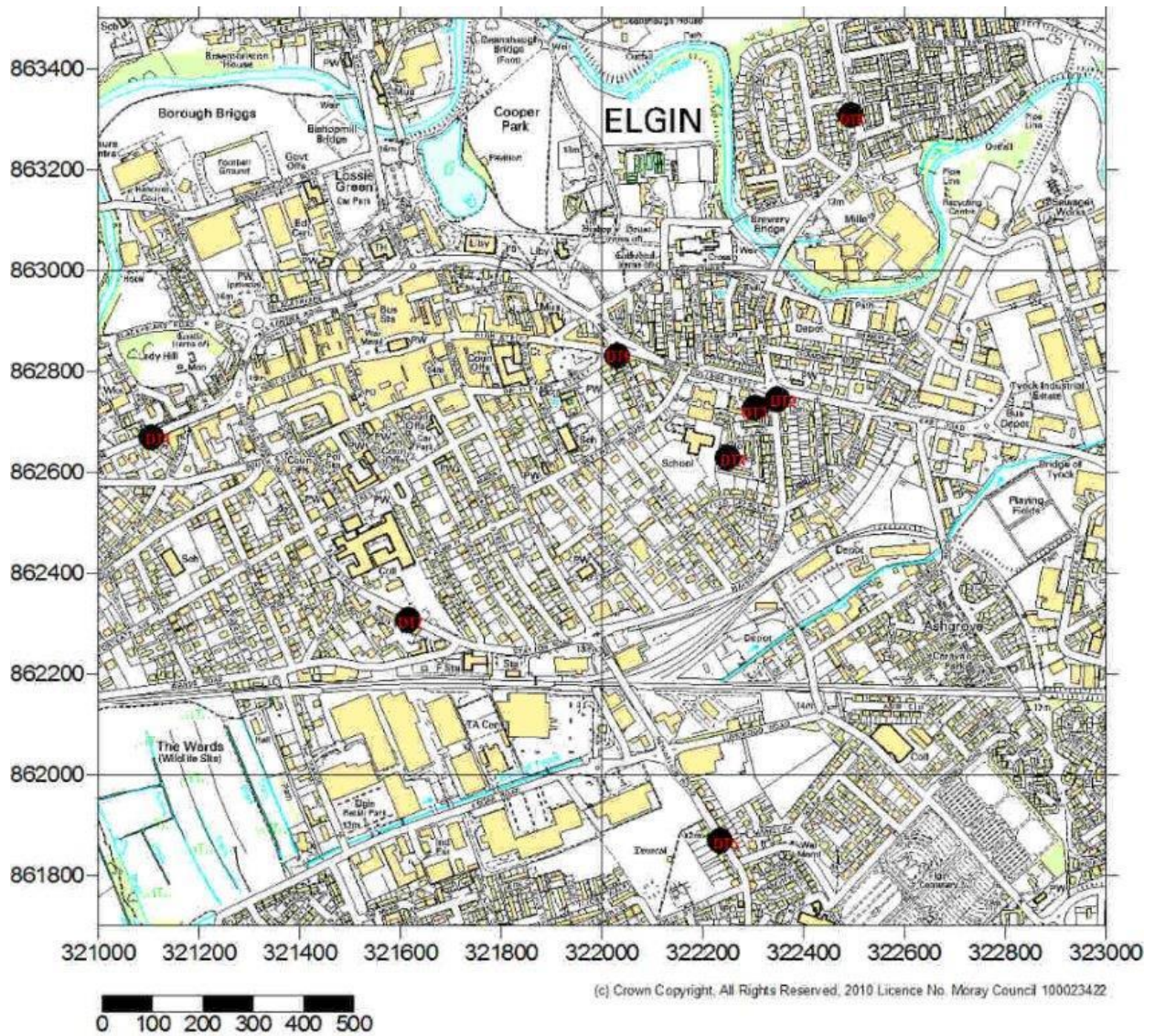


Figure 2.3 Fochabers NO₂ Monitoring Sites

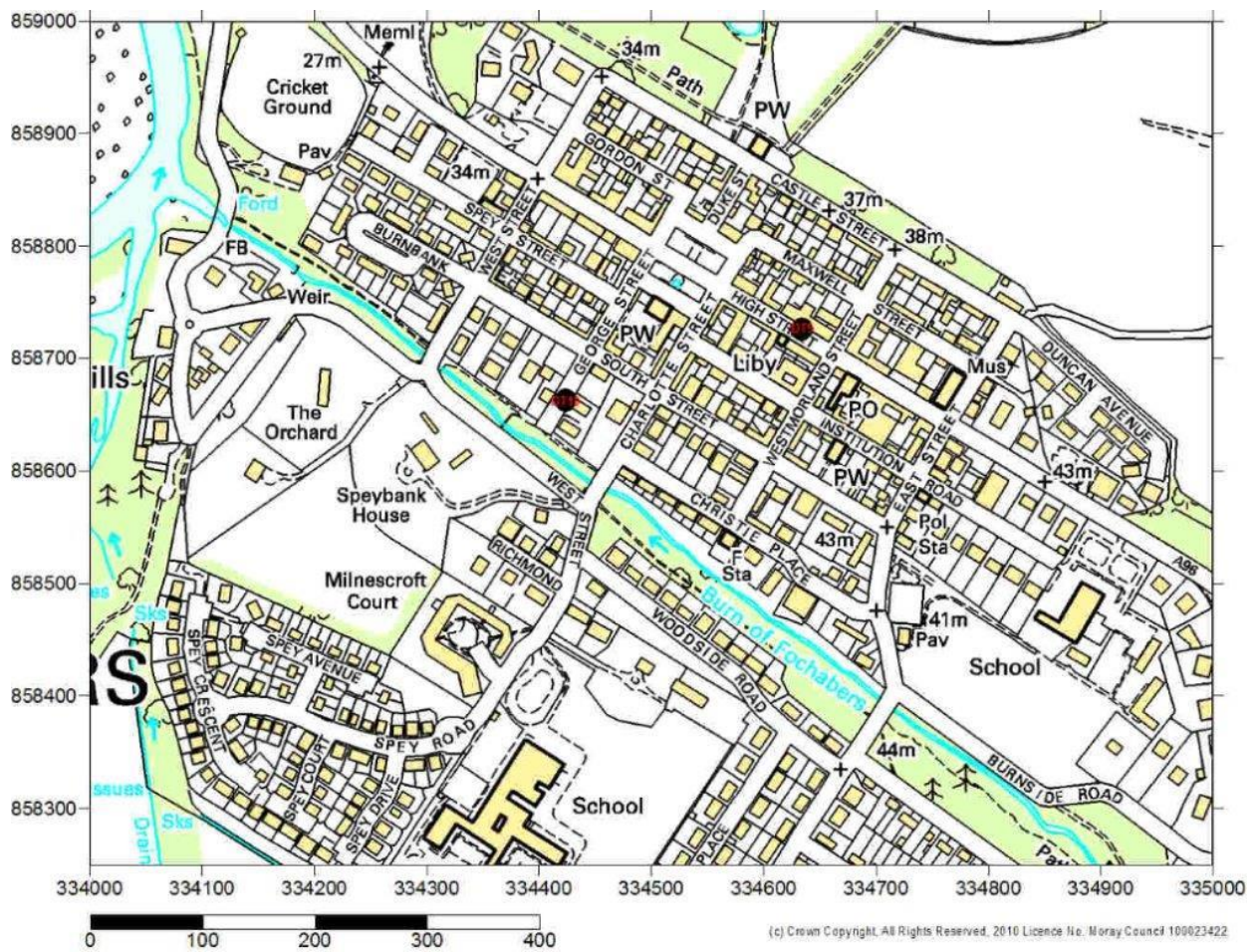


Figure 2.4 Forres NO₂ Monitoring Sites

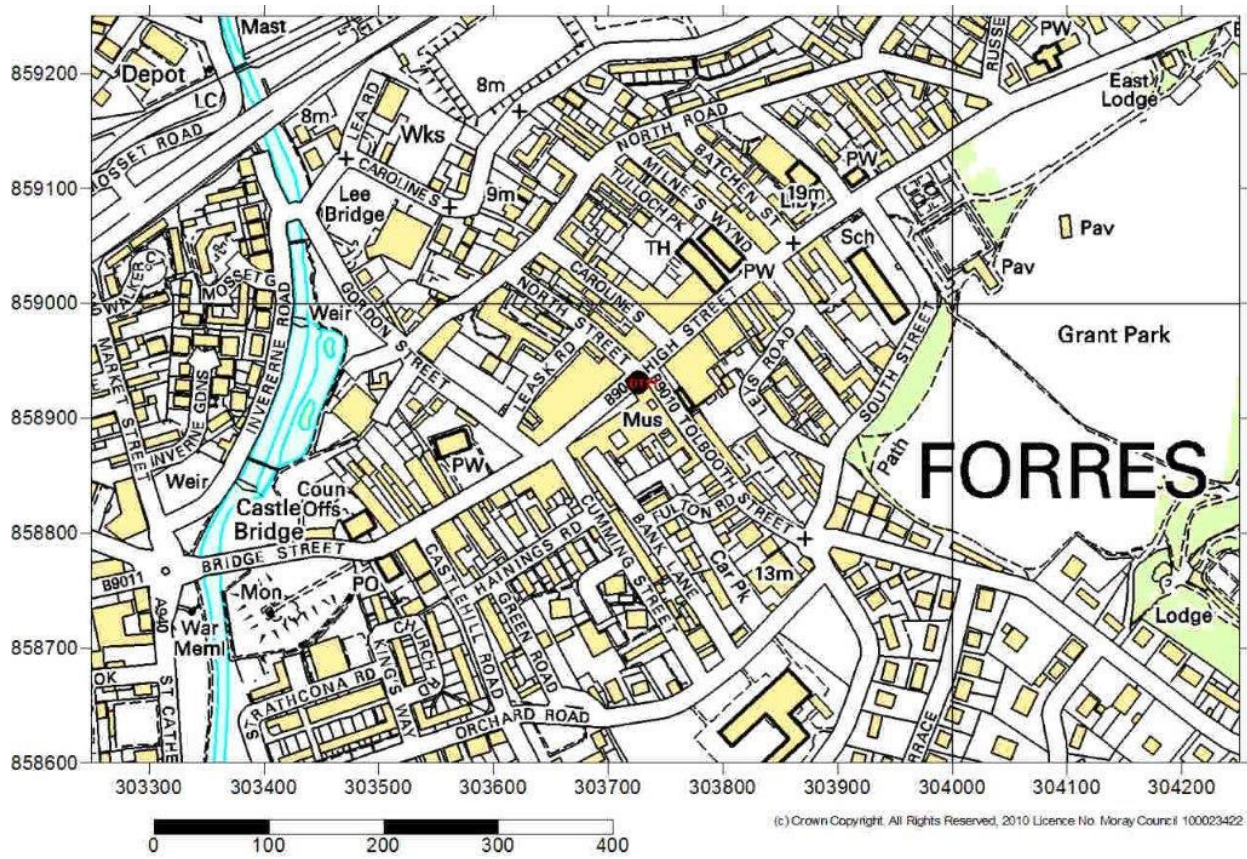


Figure 2.5 Keith NO₂ Monitoring Sites

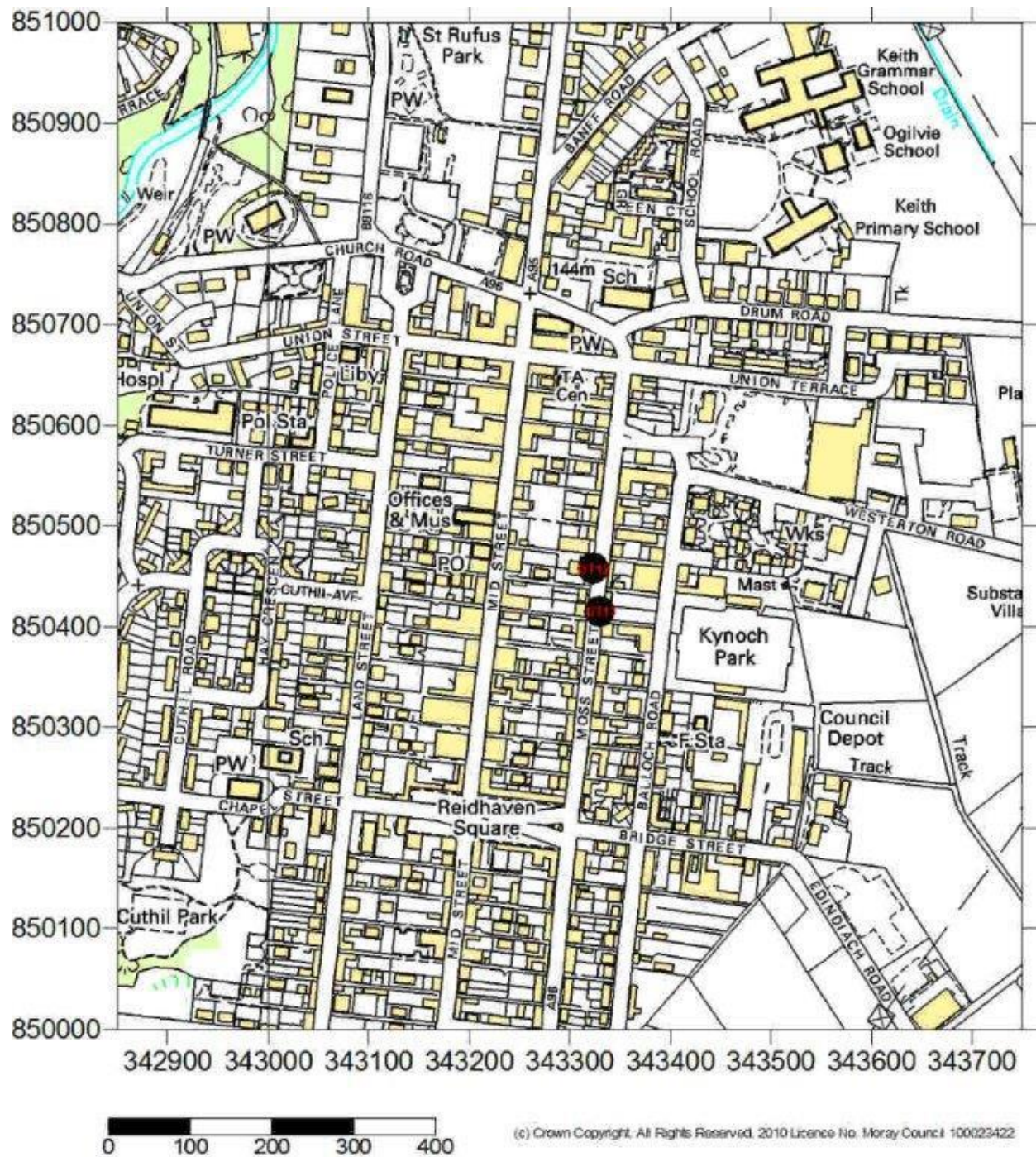


Figure 2.6 Lossiemouth NO₂ Monitoring Sites

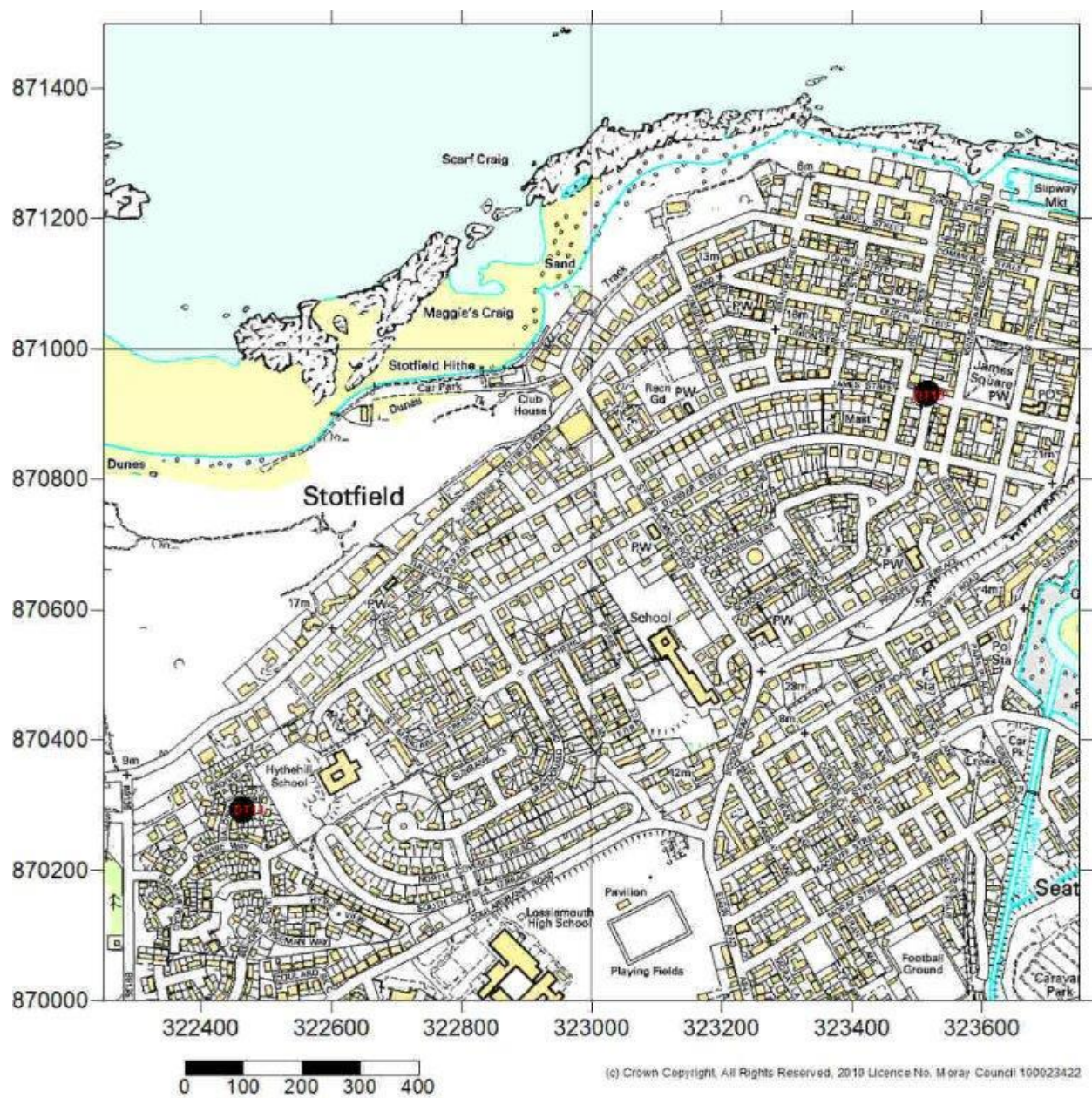
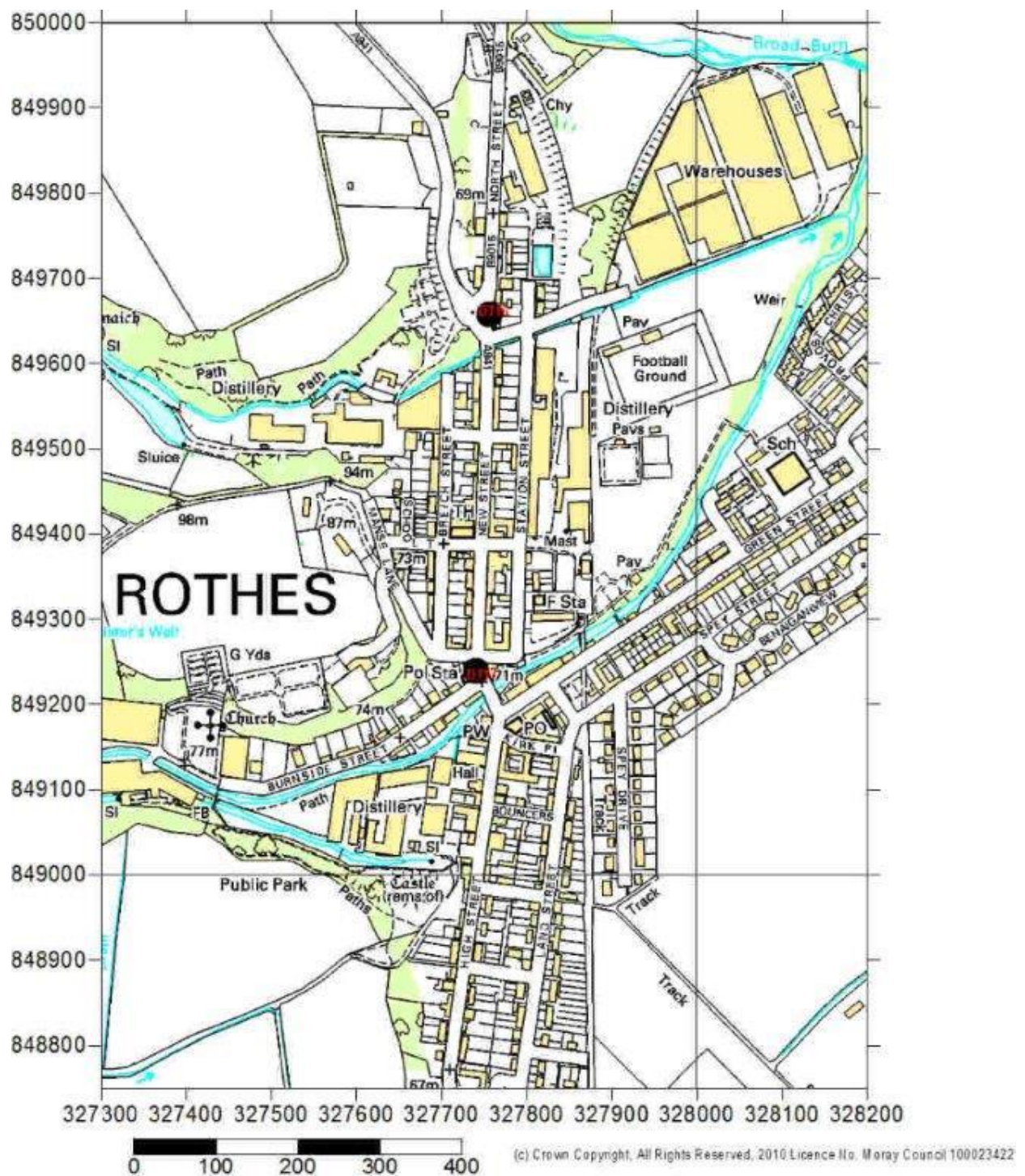


Figure 2.7 Rothes NO₂ Monitoring Sites



2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO₂)

Diffusion Tube Monitoring Data

A summary of the bias-adjusted annual mean diffusion tube concentrations of NO₂ across the monitoring network for 2012 is shown in Table 2.2. The raw monthly results are included in Appendix A. A summary of data for the last five years is shown in Table 2.3.

A trend graph is shown in Figure 2.8 which illustrates that there is a general downward trend in annual mean NO₂ concentrations across the diffusion tube network. The concentration has decreased at 13 out of 17 sites between 2011 and 2012. There was a moderate increase at 3 Elgin sites (E2-DT2, E3-DT3 and E4-DT4) and at one of the Keith sites (K1-DT13), however, the annual mean remains considerably below the limit of 40µg/m³ at all locations.

There is a significant reduction in concentration in Fochabers High Street (F1-DT9) from between 30-37µg/m³ in recent years to 12.2µg/m³ in 2012 which is likely to be due to the opening of the Bypass in January 2012, reducing traffic flow in Fochabers High Street.

The maximum annual mean in 2012 was 28.8µg/m³ in Moss Street, Keith (DT13).

2.2.1 Summary of Compliance with AQS Objectives

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

Table 2.2 Results of NO₂ Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean Concentration (µg/m ³) - Bias Adjustment factor = 0.83
DT1	Lamp Post West Park Court-Elgin	Kerbside	N	N	83.3	23.5
DT2	Junction East & Maisondieu Rd-Elgin	Kerbside	N	N	100.0	26.2
DT3	99-101 Maisondieu Road-Elgin	Roadside	N	N	83.3	14.1
DT4	26-28 Priory Place-Elgin	Urban Background	N	N	100.0	9.7
DT5	Main Street New Elgin	Kerbside	N	N	83.3	18.2
DT6	Queen Street Roundabout-Elgin	Kerbside	N	N	100.0	18.5
DT7	Hay Street-Elgin	Roadside	N	N	91.7	11.5
DT8	Newmill Road-Elgin	Roadside	N	N	100.0	14.9
DT9	50A High Street-Fochabers	Kerbside	N	N	100.0	12.2
DT10	Sundach George Street-Fochabers	Urban Background	N	N	100.0	4.7
DT11	Tolbooth, High Street-Forres	Roadside	N	N	91.7	14.1
DT12	106 Moss Street-Keith	Kerbside	N	N	100.0	28.8

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (%)	2012 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Bias Adjustment factor = 0.83
DT13	87 Moss Street-Keith	Kerbside	N	N	100.0	22.8
DT14	1 Merryton Court-Lossmouth	Urban Background	N	N	66.7	6.2 ¹
DT15	7 James Street-Lossmouth	Kerbside	N	N	91.7	6.1
DT16	New Street-Rothes	Roadside	N	N	100.0	18.5
DT17	New Street-Rothes	Roadside	N	N	100.0	18.9

¹ Tubes were missing from the Merryton Court, Lossmouth Site (DT14) from May-August. The period mean has been annualised from those sites with 12 months data capture in accordance with the methodology in Box 3.2 in LAQM.TG(09) (Ref.3). The calculations are shown in Appendix A.

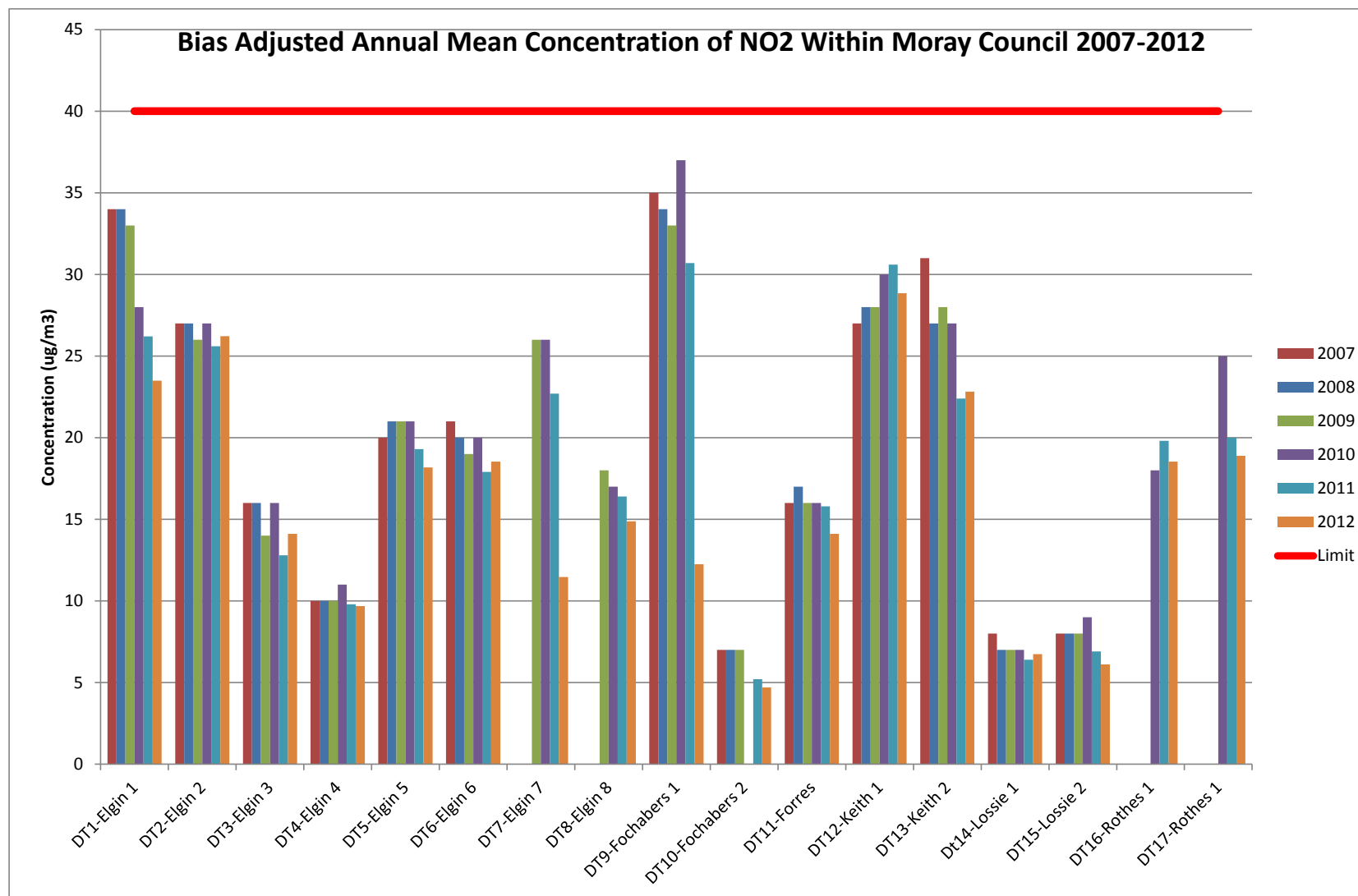
Table 2.3 Results of NO₂ Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 0.88)	2009 (Bias Adjustment Factor = 0.84)	2010 (Bias Adjustment Factor = 0.82)	2011 (Bias Adjustment Factor = 0.85)	2012 (Bias Adjustment Factor = 83)
DT1	Kerbside	N	34	33	28	26.2	23.5
DT2	Kerbside	N	27	26	27	25.6	26.2
DT3	Roadside	N	16	14	16	12.8	14.1
DT4	Urban Background	N	10	10	11	9.8	9.7
DT5	Kerbside	N	21	21	21	19.3	18.2
DT6	Kerbside	N	20	19	20	17.9	18.5
DT7	Roadside	N	-	26	26	22.7	11.5
DT8	Roadside	N	-	18	17	16.4	14.9
DT9	Kerbside	N	34	33	37	30.7	12.2
DT10	Urban Background	N	7	7	6	5.2	4.7
DT11	Roadside	N	17	16	16	15.8	14.1
DT12	Kerbside	N	28	28	30	30.6	28.8
DT13	Kerbside	N	27	28	27	22.4	22.8
DT14	Urban Background	N	7	7	7	6.4	6.2 ²
DT15	Kerbside	N	8	8	9	6.9	6.1
DT16	Roadside	N	-	-	18 [^]	19.8	18.5
DT17	Roadside	N	-	-	25 [^]	20.0	18.9

[^] Site commenced during 2009, first annual mean available in 2010

² Tubes were missing from the Merryton Court, Lossiemouth Site (DT14) from May-August. The period mean has been annualised from those sites with 12 months data capture in accordance with the methodology in Box 3.2 in LAQM.TG(09) (Ref.3). The calculations are shown in Appendix A.

Figure 2.8 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



3 New Local Developments

This section examines any local development changes that have taken place since the last Updating and Screening Assessment (Ref.4) which may affect air quality.

The items included are:

- Road Traffic Sources;
- Other Transport Sources;
- Industrial Sources;
- Biomass Sources
- Commercial and Domestic Sources; and
- Fugitive and Uncontrolled Sources.

3.1 Road Traffic Sources

A review of traffic flow data was undertaken in order to establish if there were any significant changes in traffic flow since 2011 that could impact on local air quality.

The Moray Council Transportation Section was consulted to obtain automatic traffic count information for Council operated sites in and around Elgin for 2012. A map showing the count locations is shown in Figure 3.1 and the data for 2009-2012 are summarised in Table 3.1 below.

Figure 3.1 Location Map of Automatic Traffic Counts in Elgin

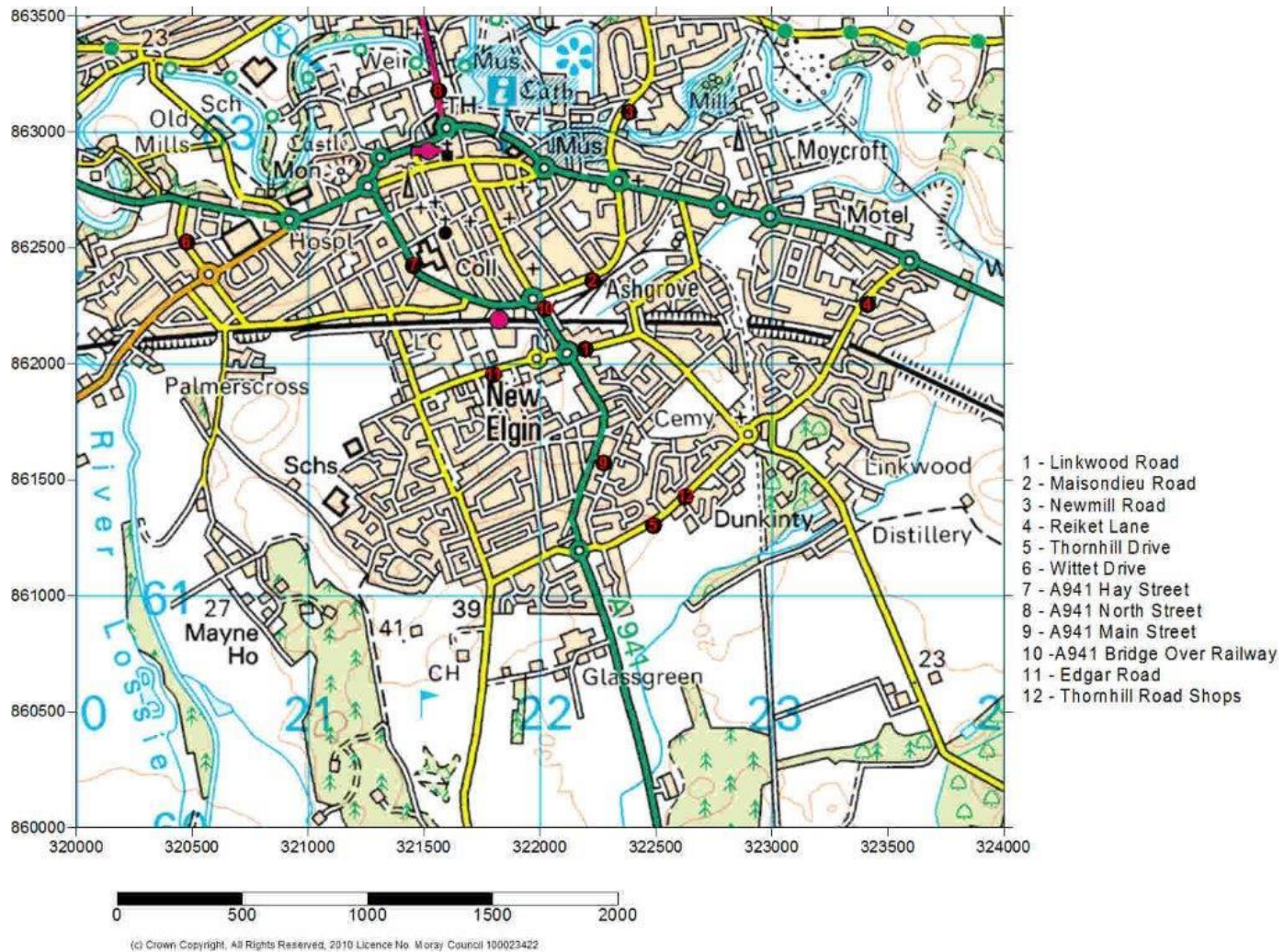


Table 3.1 Summary of Council Operated Traffic Counts Elgin 2009-2012

ID	Description	Annual Average Daily Traffic (AADT)				% Change 2011-2012
		2009	2010	2011	2012	
1	Linkwood Road	8031	8189	8357	8600	2.9
2	Maisondieu Road	9668	7987	7867	7938	0.9
3	Newmill Road	10879	10630	10435	No data ³	
4	Reiket Lane	-	6414	6865	7377	7.5
5	Thornhill Road	4100	5343	5618	5787	3.0
6	Wittet Drive	3576	3468	3726	3593	-3.6
7	A941 Hay St	12920	12776	12582	12998	3.3
8	A941 North St	16266	15654	15663	15307	-2.3
9	A941 Main St	11433	10638	10620	10718	0.9
10	A941 Bridge over Railway	22555	20819	20341	20252	-0.4
11	Edgar Rd	7790	7925	7955	8220	3.3
12	Thornhill Rd Shops	-	-	2834	3061	8.0

There are no sites with significantly increased traffic flow that would require a screening assessment.

Transport Scotland was consulted in order to obtain automatic traffic count data for 2011 for the trunk roads A95 and A96 that are the main routes through the Moray Council area. A map showing the count locations is shown in Figure 3.2 and the data for 2009-2012 are summarised in Table 3.2.

³ Counter removed due to bridge replacement works

Figure 3.2 Location Map of Transport Scotland Automatic Traffic Counts in Moray

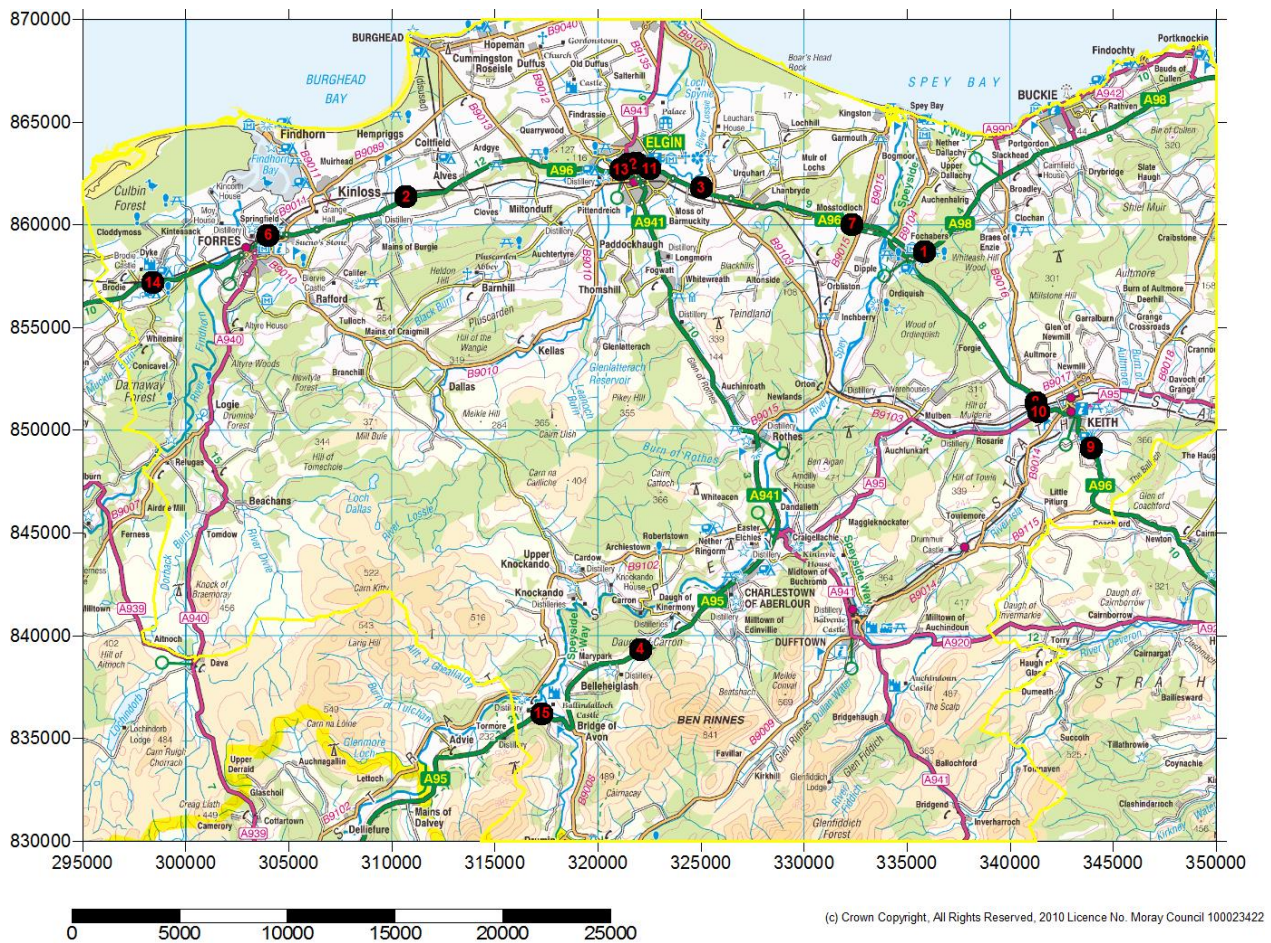


Table 3.2 Summary of Trunk Road Traffic Count Data for A95 & A96 2009-2012

ID	Description	AADT				% Change 2010-2011
		2009	2010	2011	2012	
1	A98 Fochabers	6528	6379	5957	No data	-
2	A96 Forres to Elgin	11309	11416	11075	11054	-0.2
3	A96 Elgin to Lhanbryde	16408	16212	15964	16211	1.5
4	A95 Dowans Brae	2854	2702	2761	2773	0.4
5	A96 Elgin Town Centre	17271	16502	16524	16525	0.0
6	A96 Forres	11641	11164	11039	11376	3.1
7	A96 Mosstodloch	14016	13712	7403	1436	-80.6
8	A96 North of Keith	6287	6020	5805	6341	9.2
9	A95 West of Keith	2005	2124	2291	1794	-21.7
10	A96 Elgin - East Road	22853	21254	21605	21981	1.7
11	A96 Elgin – Alexandra Road	22789	21617	21656	21290	-1.7
12	A96 Elgin - High Street West	13454	13083	13245	12849	-3.0
13	A96 Elgin - West Road	15193	15112	14667	14791	0.8
14	A96 Brodie (WiM)	10923	10194	10015	9856	-1.6
15	A96 Forres (aka Brodie)(Core 744)	10503	10196	10019	9881	-1.4
16	A95 Ballindalloch (Core 905)	2235	2207	2261	2096	-7.3

The AADT flows have decreased on 9 out of 16 of the road links between 2011 and 2012. The maximum increase is 8% on the A96 north of Keith. The vast reduction in traffic flow on the A96 Mosstodloch is due to the complete opening of the new bypass in 2012. It is not expected that there will be any exceedences of the NAQS objectives at nearby receptors due to changes in traffic flow on the trunk roads.

There are proposals for a new Western Link Road linking the A96 to the west of Elgin with Edgar Road in New Elgin to the south. More details of the development can be seen on the Moray Council web site at

http://www.moray.gov.uk/moray_standard/page_76809.html. The proposed scheme will result in an increase in traffic flow on some roads, but a decrease on others. The scheme has been designed to cater for housing, retail and commercial development in the south of the city and ease congestion on existing routes connecting the south of Elgin with the A96 to the west. An Air Quality Impact Assessment has been requested by The Moray Council Environmental Health Section to be submitted with the planning application. In addition, The Moray Council commenced diffusion tube monitoring at 2 new sites at each end of the proposed route (Whittet Drive and Sandy Road) at the beginning of 2013 in order to obtain existing background concentrations of NO₂.

The results of these will be discussed in a future report.

No other new or significantly changed roads were identified.

3.2 Other Transport Sources

There have been no significant changes in rail or shipping operations within the Moray Council area since the 2012 USA Report (Ref.4).

Flight operations at Lossiemouth have changed from Tornados to Typhoons and RAF Kinloss is now an army barracks with minimal flight movements. It is therefore expected that emissions from air traffic will be reduced across the Moray Council area.

The Moray Council confirms that there are no new or newly identified transport sources which are likely to have an impact on air quality within the Local Authority area.

3.3 Industrial Sources

SEPA and The Moray Council confirm that there are no new or significantly changed industrial developments which may have an impact on air quality within the Local Authority area.

3.4 Commercial and Domestic Sources

The Moray Council has approved 10 planning applications for developments relating to biomass installations since the last USA report (Ref.4). Some are for the installation of boiler plant, while others are for the erection of buildings to house biomass boiler plant or fuel storage. A summary is provided in Table 3.3.

The Environmental Health Section within the Moray Council has an established team of personnel who undertake the appropriate air quality impact screening assessments of all proposed wood burning biomass installations in accordance with the Environmental Protection UK guidance (Ref.16) and ensure installations are compliant with the Clean Air Act 1993 and are not likely to result in a breach of air quality standards for NO₂ and PM₁₀ before granting permission.

Copies of calculations are included in Appendix B.

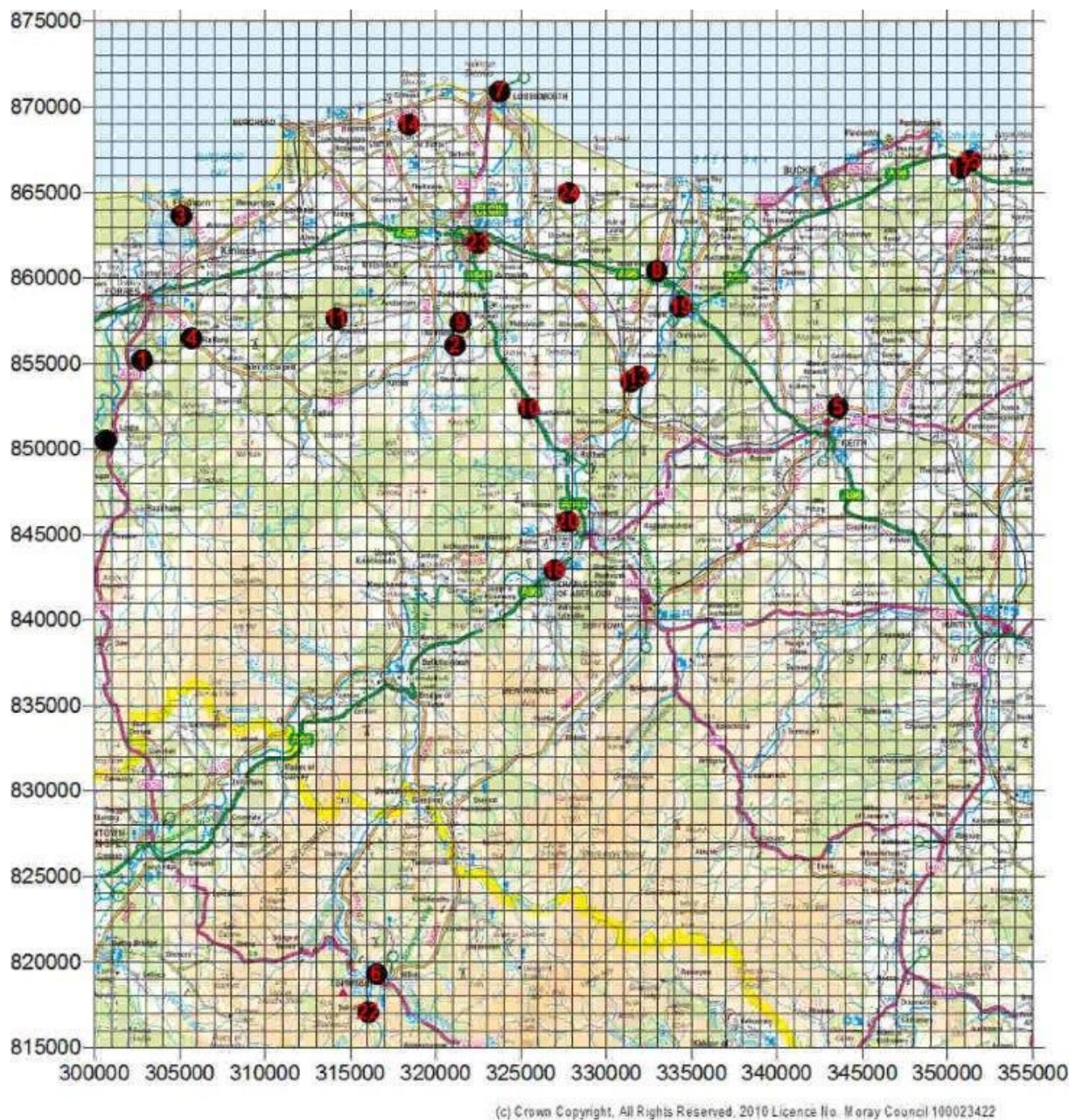
While each installation has been assessed for potential air quality impact, the potential combined impact of clusters of installations needs to be considered for PM₁₀. The Moray Council keeps a log of all biomass installations and their geographical location and combined impacts are assessed at each Updating and Screening Assessment. The locations of current and consented installations are shown in the map in Figure 3.3.

Table 3.3 Planning Applications Permitted for Biomass Developments in 2012-13

Application Reference	Description	Applicant	Date Permitted
11/01981/APP	Replacement of existing Boiler with new biomass boiler and hopper system at Gordonstoun School, Duffus, Elgin, Moray IV30 5RF	Gordonstoun School	09/04/12
12/00193/APP	Erection of biomass heating cabin at Seafeld Estate Office York Place, Cullen, Buckie, Moray AB56 4UW	Seafeld Estate per Highland Wood	02/07/12
12/00267/LBC	Installation of biomass heating plant and its serving flue at Old Cullen House and the Stable Block, Cullen, Buckie, Moray, AB56 4XW	Seafeld Estate	18/04/12
12/00266/APP	Installation of biomass heating plant and ancillary wood chip store to serve Old Cullen House and the Stable Block, Cullen, Buckie, Moray, AB56 4XW	Seafeld Estate	18/4/12
12/00457/APP	Erection of biomass boiler room storage container and access road at Speyside High School, Mary Avenue, Aberlour, Moray AB38 9QU	The Moray Council	07/06/12
12/01282/APP	Create a biomass boiler and flue silo house at Milnes High School, West Street, Fochabers, Moray, IV32 7DJ	The Moray Council	09/10/12
12/01490/APP	Biomass combined heat and power plant providing electricity to the grid and heat to The Macallan Distillery at Craigellachie Wood, Craigellachie, Moray*	Speyside Renewables Energy Partnership	08/03/13
12/01395/APP	Siting a biomass boiler heat cabin at Logie Steading, Logie, Forres, Moray, IV36 2QN	AG Laing 1961 Settlement	06/11/12
12/02/2082	Erect outbuilding to house biomass boiler and woodchip storage at Deinabo House, Tomintoul, Ballindalloch, Moray, AB37 9HT	Deinabo Estate Ltd	01/02/13
10/02024/APP	Erection of supermarket (Class 1) petrol filling station access car parking landscaping and associated works at Elgin Auction Mart New Elgin Road Elgin Moray	Sainsburys Supermarkets Ltd & Macdonalds Estates PLC	PENDING
12/01315/APP	Extension to building to house wood fuel boiler at The Stables, Innes House, Urquhart, Elgin, Moray	Innes Estate	2013

*Air Quality Impact Screening calculations were carried out by The Moray Council Environmental Services Section with this exception which was carried out by SEPA. Available calculation spreadsheets are shown in Appendix B

Figure 3.3 Location Map of Biomass Installations in Moray



The map shows 1km x 1km grid squares. It can be seen that the installations are widely spread across the Council area, mostly in rural locations and there are no clusters in a 500 x 500m² area or installations adjacent to any areas of concentrated domestic solid fuel burning.

Previous reports concluded that there were no areas of domestic solid-fuel burning with a density of greater than 100 houses in a 500 x 500m area. There have been no

new areas of development with significant solid-fuel burning and it is therefore not necessary to undertake any further assessment.

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

3.5 New Developments with Fugitive or Uncontrolled Sources

SEPA confirmed that there were no new industrial sources of fugitive emissions within the Moray Council area.

The Moray Council confirms that there are no potential sources of fugitive emissions that have not been previously assessed within the local authority area.

4 Planning Applications

Planning applications relating to biomass installations that have been permitted have already been discussed in Section 3.4. There is an application pending (10/02024/APP) for a biomass installation at a supermarket on the old Auction Mart site in Elgin. A screening assessment of the air quality impact of the installation has been undertaken and is included in Appendix B.

There are no other planning applications with a potential impact for local air quality.

5 Air Quality Planning Policies

The Moray Council has several planning policies contained within the Local Plan (Ref.17), Development Plan and Structure Plan (Ref.18) as well as supplementary planning guidance which relate to air quality and atmospheric pollution. These policies ensure that appropriate assessments are made when considering planning applications for developments or variations within the Moray Council area.

These were described in previous reports and remain unchanged.

6 Local Transport Plans and Strategies

The Moray Council Local Transport Strategy (LTS) (Ref.20) sets out how the Council intends to reconcile international, national, regional and local objectives at the local level and outlines actions which will achieve these objectives. It contains a series of aims, objectives, policies and actions supporting the overall vision to meet the transport needs of all within The Moray Council area.

As part of the preparation of the LTS, a Strategic Environmental Assessment (SEA) was undertaken identifying key environmental issues and the relationship with other plans, policies and strategies.

Key environmental baseline information was gathered for the report. The baseline air quality data was obtained from the air quality monitoring carried out by the Council and was considered good as all pollutants are below the AQS objectives.

Consultations and workshops were set up with a number of interested parties including community councils, schools, public transport providers, local freight operators and representatives of the national freight organizations, special interest groups such as the elderly and disabled groups and members of the public.

As expected in a rural area such as Moray, public consultation identified a need for better public transport links. However, whilst this is undoubtedly a very difficult matter when considering air quality, unlike the large urban areas of the Central Belt in Scotland the present level of road traffic in Moray is not regarded as an obstacle to achieving this.

Within Moray, there is not a significant congestion issue. The proposal for the Western Link Road in Elgin is designed to cater for housing, retail and commercial development and contribute to the growth of South Elgin and alleviate potential congestion hotspots in the south and west of the City.

There is almost unanimous recognition of the vital role played by road transport in Moray amongst those consulted. There is considerable support in this area for improvements to existing roads rather than targets for reducing the traffic on the network. The opening of the A96 Fochabers and Mosstodloch Bypass has achieved significant improvements in traffic flow across the area and eased congestion in both villages.

The general need for reduction in levels of road traffic in parts of Scotland is not being challenged in the report, and there is general agreement that wherever possible efforts should be made to encourage the use of modes of transport other than the private car. The Council is currently pursuing various initiatives which would at least make a small contribution to this objective. These include Safer Routes to School, Rural Transport Initiatives and the preparation of Access and Cycling Strategies. Nevertheless, it must be acknowledged that the character of Moray, which is dictated by its rural location and the particular constraints which apply to public transport, means that some measures which might be successful in other parts of Scotland would be wholly inappropriate in this area.

The consistent approach of Moray Council to improving its transport network is shown to be maintained throughout the Development Plan policies and the Local Transport Strategy. Therefore it is not considered that setting targets to reduce traffic volumes on non-trunk roads is appropriate in Moray.

7 Climate Change Strategies

The Climate Change (Scotland) Act 2009 requires public bodies to act in the way best calculated to contribute to the delivery of the emissions targets in the Act and the Government's climate change adaptation programme in the most sustainable way.

The Moray Council Climate Change Action Plan (Ref.20) established a framework for action in Moray, to tackle the causes and consequences of climate change. It describes the present situation, future intentions and actions for the Moray Council. While the measures will have benefits in many areas, some will be directly linked to improvements in air quality, particularly improvements to the council vehicle fleet and reduction in business mileage.

In order to seek to fulfill these requirements the aims of the Moray Climate Change Action Plan are as follows:

- To contribute towards national targets to reduce CO₂ emissions by 80% by 2050 and interim target of 42% by 2020.
- To contribute towards the achievement of the Scottish Government's National Outcomes 12 and 14.
- To ensure climate change risks to Moray are appropriately identified, assessed, communicated and managed.

Tackling climate change will require the Council to work in partnership with community planning partners, the wider community as well as the business and voluntary sectors. In order to meet these objectives, a programme of actions has been identified for implementation during the period 2010 to 2015.

The main projects are as follows.

- Implementation of Carbon Management plan to reduce the Council's emissions by 30% over 5 years
- Dissemination of Awareness raising campaign to encourage behavioral change

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- Installation of energy efficiency measures across Council buildings to reduce emissions
- Adoption and Implementation of corporate and office travel plans
- Reduce business and fleet mileage through vehicle rationalization and increased use of video and teleconferencing
- Promotion and installation of renewables, development of Renewable Energy Action Plan for Moray
- Develop Green Procurement Strategy
- Reduce waste by introducing food composting and anaerobic digestion

Significant progress has been made in these projects including the installation of biomass boilers in schools as detailed in Section 3.4.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The results of the NO₂ monitoring across The Moray Council during 2012 confirm that there are no exceedences of the AQS objectives for this pollutant.

Analysis of NO₂ concentrations during the period 2009-2012 shows that the concentrations are showing a general downward trend.

The review of new monitoring data available for 2012 confirms that The Moray Council does not need to proceed to a Detailed Assessment for any pollutant.

8.2 Conclusions relating to New Local Developments

The opening of the A96 Fochabers and Mosstodloch Bypass in 2012 has significantly reduced traffic flow and congestion in both villages and resulted in a significant decrease in the NO₂ concentration in Fochabers High Street.

The proposed Western Link Road in Elgin will result in an increase in traffic flow on some roads, but a decrease on others. The scheme has been designed to cater for housing, retail and commercial development in the south of the city and is a key part of the LTS. It will ease congestion on existing roads that connect this area with the A96 to the west of Elgin. An Air Quality Impact Assessment has been requested by The Moray Council Environmental Health Section to be submitted with the planning application for this development. The results of this will be discussed in a future report. In addition, The Moray Council commenced diffusion tube monitoring at 2 new sites at each end of the proposed route (Whittet Drive and Sandy Road) at the beginning of 2013 in order to obtain existing background concentrations of NO₂.

8.3 Proposed Actions

The Progress Report has not identified a need to proceed to a Detailed Assessment for any pollutant.

The current NO₂ monitoring and traffic flow monitoring will continue during 2013. The results of these activities will be included in the next Progress Report due for submission in April 2014.

9 References

- 1) The Environment Act (1995)- © Crown Copyright
- 2) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland. July 2007
- 3) Local Air Quality Management Technical Guidance LAQM TG.(09) – DEFRA
- 4) Moray Council LAQM Updating and Screening Assessment 2012, TSI Scotland Ltd Report Ref: TSI/MOR003-04-02, April 2012
- 5) 2011 Air Quality Progress Report for The Moray Council, TSI Scotland Ltd, Report Ref: TSI/MOR.001-04-03, June 2011
- 6) Moray Council LAQM Progress Report 2010, BMT Cordah Ltd Report Ref: G_MOR_015, May 2010
- 7) Moray Council LAQM Updating and Screening Assessment 2009, BMT Cordah Ltd Report Ref: G_MOR_014, May 2009
- 8) Moray Council LAQM Progress Report 2008, BMT Cordah Ltd Report Ref: G_MOR_013, May 2008
- 9) Moray Council LAQM Progress Report 2007, BMT Cordah Ltd Report Ref: E_MOR_012, April 2007
- 10) Moray Council LAQM Updating and Screening Assessment 2006, BMT Cordah Ltd Report Ref: E_MOR_011, April 2006
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- 12) Moray Council LAQM Progress Report 2005, BMT Cordah Ltd Report Ref: E_MOR_010, May 2005
- 13) Air Quality Study in the Vicinity of RAF Lossiemouth and RAF Kinloss, BMT Cordah Ltd, Report Ref: MOR_007, November 2004
- 14) Supplementary Report to the Updating and Screening Assessment, BMT Cordah Ltd, Report Ref: MOR_008, January 2004
- 15) Updating and Screening Assessment, BMT Cordah Ltd, Report Ref: MOR_005, 2003

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- 16) Environmental Protection UK, Biomass and Air Quality Guidance for Scottish Local Authorities, June 2010, www.environmental-protection.org.uk/biomass
- 17) Moray Structure Plan, April 2007
- 18) The Moray Council, Local Plan 2008, December 2008
- 19) Local Transport Strategy, Jacobs Consultancy, June 2010, <http://www.moray.gov.uk/downloads/file64607.pdf>
- 20) The Moray Climate Change Action Plan, January 2011, Planning and Development Services, The Moray Council
- 21) [http://laqm.defra.gov.uk/documents/Diffusion Tube Factors v04 11 v6.xls](http://laqm.defra.gov.uk/documents/Diffusion_Tube_Factors_v04_11_v6.xls)

Appendices

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

Appendix A: QA:QC Data

Table A1: Raw Unadjusted Monthly Diffusion Tube NO₂ Concentrations

ID	SITE	JAN	FEB ⁴	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Data Capture %	MEAN
DT1	Lamp Post West Park Court-Elgin	33	31	lost	Lost	28	31	23	23	26	33	28	27	83.3	28.3
DT2	Junction East & Maisondieu Rd-Elgin	32	32	29	39	27	37	28	26	27	35	33	34	100.0	31.6
DT3	99-101 Maisondieu Road-Elgin	17	14	15	21	18	21	lost	Lost	8	17	19	20	83.3	17.0
DT4	26-28 Priory Place-Elgin	15	15	11	12	9	9	7	7	7	15	15	18	100.0	11.7
DT5	Main Street New Elgin	Lost	27	22	22	13	lost	15	17	17	27	30	29	83.3	21.9
DT6	Queen Street Roundabout-Elgint	26	24	24	23	22	19	14	15	17	27	27	30	100.0	22.3
DT7	Hay Street-Elgin	Lost	15	14	17	14	15	12	10	8	15	14	18	91.7	13.8
DT8	Newmill Road-Elgin	25	25	21	11	11	8	8	13	14	22	29	28	100.0	17.9
DT9	50A High Street-Fochabers	19	21	14	19	16	18	13	12	11	5	14	15	100.0	14.8
DT10	Sunnach George Street-Fochabers	5	7	5	6	5	5	5	5	5	5	7	8	100.0	5.7
DT11	Tolbooth, High Street-Forres	17	20	18	15	14	15	lost	13	12	18	24	21	91.7	17.0
DT12	106 Moss	45	37	36	42	20	26	21	28	31	46	48	37	100.0	34.8

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	Street-Keith														
DT13	87 Moss Street-Keith	25	24	27	35	26	32	22	25	20	33	29	32	100.0	27.5
DT14	1 Merryton Court-Lossiemouth	9	10	7	5	Lost	lost	lost	lost	5	9	9	11	66.7	8.1
DT15	7 James Street-Lossiemouth	10	10	9	6	5	6	5	5	5	lost	10	10	91.7	7.4
DT16	New Street-Rothes	22	26	27	26	18	18	14	20	20	27	25	25	100.0	22.3
DT17	New Street-Rothes	22	28	24	26	19	23	16	17	20	24	27	27	100.0	22.8

Table A.2 Short-Term to Long-Term Monitoring Data Adjustment

Site ID	Town	Location	Site Type	Annual Mean (Am) µg/m ³	Period Mean (Pm) µg/m ³	Ratio Am/Pm µg/m ³
DT2	Elgin 2	Junction East & Maisondieu Rd	Kerbside	31.6	32.6	0.97
DT4	Elgin 4	26-28 Priory Place	Urban Background	11.7	13.5	0.86
DT6	Elgin 6	Queen Street Roundabout	Kerbside	22.3	24.8	0.90
DT8	Elgin 8	Newmill Road	Roadside	17.9	21.9	0.82
DT9	Fochabers 1	50A High Street	Kerbside	14.8	14.8	1.00
DT10	Fochabers 2	Sunndach George Street	Urban Background	5.7	6.0	0.94
DT12	Keith 1	106 Moss Street	Kerbside	34.8	40.3	0.86
DT13	Keith 2	87 Moss Street	Kerbside	27.5	28.1	0.98
DT16	Rothies 1	New Street	Roadside	22.3	24.8	0.90
DT17	Rothies 2	New Street	Roadside	22.8	24.8	0.92
					AVERAGE	0.92
					Pm	Annualised Mean
DT14	Lossiemouth 1	1 Merryton Court	Urban Background		8.1	7.4
						Bias Adjusted Annualised Mean (x0.83)
						6.2 µg/m ³

Diffusion Tube Bias Adjustment Factors

The national bias adjustment factor spreadsheet v03_13

(<http://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html>) (Ref.21) was used to calculate the national bias adjustment factor for diffusion tubes analysed by Aberdeen Scientific Services during 2012. The laboratory uses the method 20% TEA in Acetone. The bias adjustment factor was found to be 0.83.

QA/QC of Automatic Monitoring

The NO₂ diffusion tubes used by The Moray Council were prepared and analysed by the Aberdeen Scientific Services Laboratory (ASSL) The Laboratory is UKAS accredited and has good performance in both WASP and NPL QA schemes. The laboratory demonstrated satisfactory performance in the Workplace Analysis Scheme for Proficiency (WASP) over the past five rounds with Z scores between -1.5 and 1.8.

WASP (4 tubes)

Round 116 z = -1.5, 1.5, 1.8, 0.5

Round 117 z = 0.6, 0.5, 0.5, 0.4

Round 118 z = -0.1, 0.2, 0.1, -0.2

Round 119 z = 0, 0.6, 0.2, 0.6

Round 120 z = 0.3, -0.5, -0.1, 0.3

The general classification of a Z-Score is :

$Z < \pm 2$	Satisfactory
$Z > \pm 2$ and $< \pm 3$	Warning
$Z > \pm 3$	Unsatisfactory

The results of the NPL Intercomparison Study are shown below. The overall survey had good precision and data capture with a bias correction factor of 0.81.

Checking Precision and Accuracy of Triplicate Tubes



Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2012	01/02/2012	118.4	111.3	127.6	119	8.2	7	20.3
2	01/02/2012	29/02/2012	98.6	110.0	105.3	105	5.8	6	14.3
3	29/02/2012	28/03/2012	109.6	120.7	124.8	118	7.9	7	19.5
4	28/03/2012	24/04/2012	118.0	109.6	103.5	110	7.3	7	18.1
5	24/04/2012	30/05/2012	102.7	89.9	103.8	99	7.8	8	19.3
6	30/05/2012	27/06/2012	124.8	114.9	122.1	121	5.1	4	12.7
7	27/06/2012	31/07/2012	107.1	124.9	122.5	118	9.7	8	24.0
8	31/07/2012	28/08/2012	118.3	118.6	125.8	121	4.2	4	10.5
9	28/08/2012	26/09/2012	115.7	110.6	113.2	113	2.6	2	6.3
10	26/09/2012	31/10/2012	118.5	113.3	101.9	111	8.5	8	21.1
11	31/10/2012	28/11/2012	120.3	116.2	124.4	120	4.1	3	10.2
12	28/11/2012	02/01/2013	107.9	110.0	113.9	111	3.0	3	7.6
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
93.6	87.0	Good	Good
92.1	92.6	Good	Good
92.7	97.3	Good	Good
90.7	97.7	Good	Good
80.4	94.4	Good	Good
90.3	97.5	Good	Good
100.2	96.7	Good	Good
88.0	97.7	Good	Good
89.4	86.2	Good	Good
92.7	97.3	Good	Good
108.2	76.2	Good	Good
88.6	89.5	Good	Good
Overall survey -->		Good precision	Good Overall DC

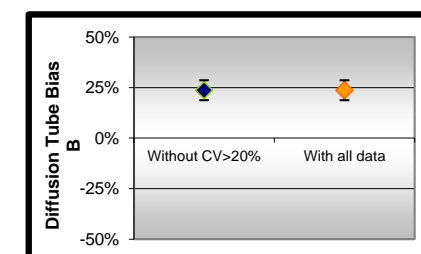
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	NPL015
----------------	--------

Accuracy (with 95% confidence interval)	
without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	0.81 (0.78 - 0.84)
Bias B	23% (18% - 28%)
Diffusion Tubes Mean:	114 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	92 μgm^{-3}
Data Capture for periods used:	93%
Adjusted Tubes Mean:	92 (89 - 96) μgm^{-3}

Precision	12 out of 12 periods have a CV smaller than 20%
-----------	---

Accuracy (with 95% confidence interval)	
WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.81 (0.78 - 0.84)
Bias B	23% (18% - 28%)
Diffusion Tubes Mean:	114 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	92 μgm^{-3}
Data Capture for periods used:	93%
Adjusted Tubes Mean:	92 (89 - 96) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Appendix B: Air Quality Impact Screening Calculations for Permitted Biomass Installations

The Moray Council

Biomass Calculation Gordonstoun School 11/1981/APP
 Date 30/03/2012 officer Gm

Data		
Boiler type and wattage		600 watts
Stack Height		11 m
Stack Diameter		0.36 m
Efflux velocity		1.17 m/s
Emmision Rates		mg/m^3
	NOx	228
	Paricles	70
Grid Ref	East	North
	318237	868863

Building Height 3.8 m

Adjacent Building Height 9 m

Background Maps

Grid Ref	East	North	Year	Line
	317500	868500	2013	47

<http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008>

Background Concentrations	
NOx	3.03 ug/m3
PM10	7.96 ug/m3
PM2,5	4.01 ug/m3

Calculate emmision rate

Area of Stack	0.10179108 M^2
Discharge Rate	0.11909556 m^3 /sec
NOx emmission	0.02715379 g/s
Particles emmmision	0.00833669 g/s

Chimey Height using Unit Conversion tool

<M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls>

Stack Height 9.61 m So 11m satisfactory

M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls

Is target rate > actual emmisoon

Target Emmission Rates	NOx annual	0.1731	g/s	Satis
	NOx Hourly	0.2227	g/s	Satis
	PM10	0.047	g/s	Satis
	PM2.5	0.0374	g/s	Satis

--

The Moray Council

Biomass Calculation		Cullen House 12/00266/APP							
Date	16/04/2012	officer	GM						
Data									
Boiler type and wattage		195kw		watts					
Stack Height		11.18		m	Building Height	9.94		m	
Stack Diameter		0.22		m	Adjacent Building Height			m	
Efflux velocity		3.48		m/s					
Emmision Rates		mg/m^3							
		NOx	183						
		Paricles	27.3						
Grid Ref		East	North						
		350774	866416						
Background Maps									
Grid Ref		East	North		Year	Line			
		350500	865500		2013	165			
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008									
Background Concentrations									
NOx		3.73		ug/m3					
PM10		7.15		ug/m3					
PM2,5		3.77		ug/m3					
Calculate emmision rate									
Area of Stack		0.03801457		M^2					
Discharge Rate		0.1322907		m^3 /sec					
NOx emmission		0.0242092		g/s					
Particles emmission		0.00361154		g/s					
Chimey Height using Unit Conversion tool									
M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls									
Stack Height		10.206 m		So m satisfactory					
M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls									
Target Emission Rates		NOx annual	0.0998	g/s	Satis				
		NOx Hourly	0.0974	g/s	Satis				
		PM10	0.0276	g/s	Satis				
		PM2.5	0.0221	g/s	Satis				

The Moray Council

Biomass Calculation		Speyside Campus 12/00457/APP							
Date	03/03/2012	officer	GM						
Data									
Boiler type and wattage		800 watts							
Stack Height		6.7 m		Building Height		5.9 m			
Stack Diameter		0.45 m		Adjacent Building Height		6.1 m			
Efflux velocity		3.86 m/s							
Emmision Rates		mg/m^3							
		NOx	117						
		Paricles	42						
Grid Ref		East	North						
		326973	843021						
Background Maps									
Grid Ref		East	North	Year	Line				
		326500	842500	2013					
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008									
Background Concentrations									
NOx		6.1 ug/m3							
PM10		6.8 ug/m3							
PM2,5		3.8 ug/m3							
Calculate emmision rate									
Area of Stack		0.15904856 M^2							
Discharge Rate		0.61392745 m^3 /sec							
NOx emission		0.07182951 g/s							
Particles emmision		0.02578495 g/s							
Chimey Height using Unit Conversion tool									
M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls									
Stack Height		6.66 m		So 6.7m satisfactory					
M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls									
Is target rate > actual emmisoon									
Target Emmission Rates		NOx annual	0.0608 g/s	Unsatis					
		NOx Hourly	0.0932 g/s	Satis					
		PM10	0.0201 g/s	Unsatis					
		PM2.5	0.0147 g/s	Unsatis					
Adjusting builing Height to 6.1m and Stack He		7.3							
Target Emmission Rates		NOx annual	0.1242 g/s	Satis					
		NOx Hourly	0.1843 g/s	Satis					
		PM10	0.041 g/s	Satis					
		PM2.5	0.0326 g/s	Satis					

The Moray Council

Biomass Calculation		Innes House 12/01315/APP							
Date	20/08/2012	officer	GM						
Data									
Boiler type and wattage				195000	watts				
Stack Height				6	m	Building Height			m
Stack Diameter				0.35	m	Adjacent Building Height		5.7	m
Efflux velocity				1.72	m/s				
Emmision Rates				mg/m^3					
		NOx		135					
		Paricles		20					
Grid Ref		East	North						
		327803	864952						
Background Maps									
Grid Ref		East	North	Year	Line				
		327500	864500	2013	196				
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008									
Background Concentrations									
NOx		3.67		ug/m3					
PM10		7.36		ug/m3					
PM2,5		3.81		ug/m3					
Calculate emmision rate									
Area of Stack		0.09621456		M^2					
Discharge Rate		0.16548905		m^3 /sec					
NOx emission		0.02234102		g/s					
Particles emmision		0.00330978		g/s					
Chimey Height using Unit Conversion tool									
M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls									
Stack Height		5.99		m	So m satisfactory				
M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls									
http://laqm.defra.gc									
Is target rate > actual emmisoon									
Target Emission Rates		NOx annual	0.0484	g/s	Satis				
		NOx Hourly	0.0846	g/s	Satis				
		PM10	0.0151	g/s	Satis				
		PM2.5	0.0109	g/s	Satis				
Stack height of 6.0m is too low and a height of 6.3m would be required.									

The Moray Council

Biomass Calculation		Milnes High School 12/01282/APP		12/02643/PLANAP					
Date	31/08/2012	officer	GM						
Data									
Boiler type and wattage				800000 watts					
Stack Height				12.1 m		Building Height		9.3 m	
Stack Diameter				0.45 m		Adjacent Building Height			
Efflux velocity				3.8 m/s					
Emmission Rates				mg/m^3					
		NOx		117					
		Paricles		42					
Grid Ref		East		North					
		334416		858326					
Background Maps									
Grid Ref		East		North		Year		Line	
		333500		857500		2013		604	
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008									
Background Concentrations									
NOx		3.91		ug/m3					
PM10		7.54							
PM2,5		3.83		ug/m3					
Calculate emmission rate									
Area of Stack		0.15904856		M^2					
Discharge Rate		0.60438454		m^3 /sec					
NOx emission		0.07071299		g/s					
Particles emmission		0.02538415		g/s					
Chimey Height using Unit Conversion tool									
M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls									
Stack Height		10.014 m		So m satisfactory					
M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls									
http://laqm.defra.gov.uk									
Is target rate > actual emmisoon									
Target Emmission Rates		NOx annual		0.2499 g/s		Satis			
		NOx Hourly		0.3477 g/s		Satis			
		PM10		0.0724 g/s		Satis			
		PM2.5		0.06 g/s		Satis			

The Moray Council

Biomass Calculation		Logie Steading 12/01395/APP							
Date	24/10/12	officer	GM						
Data									
Boiler type and wattage		195000		watts					
Stack Height		7.2		m		Building Height		3.5 m	
Stack Diameter		0.25		m		Adjacent Building Height		7 m	
Efflux velocity		3.48		m/s					
Emmission Rates		mg/m^3							
		NOx		183.2					
		Paricles		27.3					
Grid Ref		East		North					
		300695		850600					
Background Maps									
Grid Ref		East		North		Year		Line	
		300500		850500		2014		977	
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008									
Background Concentrations									
NOx		2.16		ug/m3					
PM10		6.01		ug/m3					
PM2,5		3.38		ug/m3					
Calculate emmission rate									
Area of Stack		0.04908906		M^2					
Discharge Rate		0.17082994		m^3 /sec					
NOx emission		0.03129604		g/s					
Particles emmission		0.00466366		g/s					
Chimey Height using Unit Conversion tool									
M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls									
Stack Height		7.2 m		So m satisfactory					
http://laqm.defra.gov.uk/documents/biomass_calculator_tool6.xls									
M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls									
http://laqm.defra.gc									
Is target rate > actual emmisoon									
Target Emission Rates		NOx annual		0.0504		g/s		Satis	
		NOx Hourly		0.086		g/s		Satis	
		PM10		0.016		g/s		Satis	
		PM2.5		0.0115		g/s		Satis	
formula would not accept 7.2m for stack height so calculation done with 7.5 which was the minimum accepable height.									

The Moray Council

Biomass Calculation		Delnabo Houuse							
Date	18/01/2013	officer	GM						
Data									
Boiler type and wattage		130000		watts					
Stack Height		5.4		m	Building Height		5.65		m
Stack Diameter		0.18		m	Adjacent Building Height				m
Efflux velocity		3.51		m/s					
Emmision Rates		mg/m^3							
		NOx	136						
		Paricles	28						
Grid Ref		East	North						
		316059	817041						
Background Maps									
Grid Ref		East	North	Year	Line				
		315500	816500	2014	2089				
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008									
Background Concentrations									
NOx		2.5		ug/m3					
PM10		5.93							
PM2,5		3.35		ug/m3					
Calculate emmision rate									
Area of Stack		0.02544777		M^2					
Discharge Rate		0.08932167		m^3 /sec					
NOx emmision		0.01214775		g/s					
Particles emmision		0.00250101		g/s					
Chimey Height using Unit Conversion tool									
M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls									
Stack Height		5.89 m		S O NOT satisfactory					
http://laqm.defra.gov.uk/documents/biomass_calculator_tool6.xls									
M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls									
Is target rate > actual emmisoosn									
Target Emission Rates		NOx annual	0.0478	g/s	Satis				
		NOx Hourly	0.0799	g/s	Satis				
		PM10	0.0154	g/s	Satis				
		PM2.5	0.012	g/s	Satis				
Min acceptable Height = 6.25m									

The Moray Council

Biomass Calculation	Old Mart Site - Sainbury 10/0202		12/02100/PLANAP						
Date	23/08/2012	officer	GM						
Data									
Boiler type and wattage				650000	watts				
Stack Height				10.365	m	Building Height			m
Stack Diameter				0.4	m	Adjacent Building Height		8.365	m
Efflux velocity				5.1	m/s				
Emmision Rates				mg/m^3					
		NOx		130.3					
		Paricles		29.2					
Grid Ref		East	North						
		322461	862047						
Background Maps									
Grid Ref		East	North	Year	Line				
		321500	861500	2013	362				
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps-info.php?year=2008									
Background Concentrations									
NOx		12.03		ug/m3					
PM10		7.36							
PM2,5		4.28		ug/m3					
Calculate emmision rate									
Area of Stack		0.125668		M^2					
Discharge Rate		0.6409068		m^3 /sec					
NOx emission		0.08351016		g/s					
Particles emmmision		0.01871448		g/s					
Chimey Height using Unit Conversion tool									
M:\Environmental Health\Air Quality\Biomass Workshop\Unit Con and Screening Tool.xls									
Stack Height		8.995 m		So m satisfactory					
M:\Environmental Health\Air Quality\Biomass Workshop\biomass_calculator_tool6.xls									
http://laqm.defra.gov.uk									
Is target rate > actual emmision									
Target Emission Rates		NOx annual	0.1385	g/s	Satis				
		NOx Hourly	0.2202	g/s	Satis				
		PM10	0.0527	g/s	Satis				
		PM2.5	0.0382	g/s	Satis				