



2013 Air Quality Progress Report for Aberdeenshire Council

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

June 2013

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Executive Summary

A review of monitoring data and emission sources within Aberdeenshire Council area was undertaken and resultant information compared with NAQS objectives.

Aberdeenshire Council undertook monitoring of NO₂ concentrations at 8 sites within 4 settlements. It is predicted that concentrations of NO₂ in these locations are not likely to exceed the objectives.

There are a number of new biomass developments within the local authority area. Information will continue to be sought and screening assessments undertaken. Where screening assessments have been completed, there are no exceedences of AQS objectives predicted.

There is no requirement for Aberdeenshire Council to proceed to a Detailed Assessment for any pollutant at present.

Aberdeenshire Council will continue to monitor NO₂ concentrations at 8 existing sites and also at 3 new sites, within the town of Ellon, that were identified following the previous round of Review and Assessment.

A Progress Report will be submitted in 2014.

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1 Introduction

1.1 Description of Local Authority Area

Aberdeenshire Council is located on the north-east coast of Scotland and surrounds Aberdeen City Council area. The Council area is bordered to the south by Angus and Perth and Kinross Councils and to the west by Moray and The Highland Councils. The northern and eastern borders of Aberdeenshire Council area are the Moray Firth and the North Sea coast.

The Council area is split into two distinct geographical types: the western part of the Council area is dominated by the Grampian mountain range and includes large areas of forest and moorland. The northern and eastern parts of the Council area are relatively flat with large expanses of agricultural land, coastal grassland and a greater density of urban centres.

The population of the Aberdeenshire Council area is approximately 240,000 with largest urban populations residing in Peterhead, Fraserburgh, Inverurie, Stonehaven, Westhill and Ellon. A large proportion of the Aberdeenshire population is involved in the off-shore oil and gas industry. A significant proportion of the population are also involved in the traditional industries of farming, forestry and fishing with approximately one third of Scotland's agricultural produce originating in the region. The industrial and commercial areas are primarily located in the east of the Council area around Aberdeen, Stonehaven, Peterhead and Fraserburgh. A large section of the central region of Aberdeenshire is a commuter region for Aberdeen City with a significant proportion of the local population commuting in to Aberdeen City on a regular basis.

The rail network within Aberdeenshire comprises two mainline passenger and freight rail routes: one passing north-south through the Council area along the North Sea coastline from Dundee to Aberdeen; and the second linking Aberdeen to Inverness passing through Inverurie and Huntly.

The major roads passing through the Council area comprise:

- the A90 trunk road linking the coastal towns of Fraserburgh, Peterhead, Portlethen and Stonehaven to Aberdeen and providing the arterial route south to Dundee and Central and Southern Scotland; and
- the A96 trunk road which links Aberdeen to Elgin and Inverness.

There are also several harbours and ports located along the Aberdeenshire coast which are used by fishing boats, oil and gas industry support vessels and leisure craft. The two largest ports are Peterhead and Fraserburgh where there is a significant number of fishing, commercial and oil and gas shipping operations.

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 µg/m ³	Running annual mean	31.12.2003
	3.25 µg/m ³	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m ³	Annual mean	31.12.2010
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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

Aberdeenshire Council has undertaken regular reviews of air quality since the introduction of the LAQM process. A summary of reports submitted, from 2003, is provided in Table 1.2.

Table 1.2 Details of Local Air Quality Reports submitted by Aberdeenshire Council

Date Submitted	Review & Assessment Task	Conclusions
August 2003	Updating & Screening Assessment (2003) ¹	Monitoring of NO ₂ was undertaken at 13 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
April 2004	Progress Report (2004) ²	Monitoring of NO ₂ ceased at 4 sites. Monitoring at the remaining 9 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
May 2005	Progress Report (2005) ³	NO ₂ monitoring at 9 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
June 2006	Updating & Screening Assessment (2006) ⁴	Monitoring of NO ₂ undertaken at 14 sites (5 new sites added). No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
June 2007	Progress Report (2007) ⁵	Monitoring of NO ₂ undertaken at 14 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
August 2008	Progress Report (2008) ⁶	Monitoring of NO ₂ undertaken at 14 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
July 2009	Updating & Screening Assessment (2009) ⁷	Monitoring of NO ₂ undertaken at 14 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
July 2010	Progress Report (2010) ⁸	Monitoring of NO ₂ undertaken at 14 sites. All recorded concentrations remained below the annual mean NAQS objective. Six sites will be removed from the monitoring programme over this year. No requirement for a detailed assessment.
June 2011	Progress Report (2011) ⁹	Monitoring of NO ₂ undertaken at 8 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.
September 2012	Updating & Screening Assessment (2009) ¹⁰	Monitoring of NO ₂ undertaken at 8 sites. No observed or predicted exceedences of annual mean air quality objectives. No requirement for a detailed assessment.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Aberdeenshire Council does not operate, nor does it have located within its boundaries, any automatic analysers or monitors.

2.1.2 Non-Automatic Monitoring Sites

Details of the current monitoring sites are presented in Table 2.1. Maps detailing the locations of the non-automatic monitoring sites are presented in Appendix A, Maps A.1-A.5 (p29-34).

Table 2.1 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Relevant Exposure?	Distance to kerb of nearest road	Worst-case exposure ?
Inverurie 1	Kerbside	E 377403 N 821584	NO ₂	Y (2m)	< 5m	Y
Inverurie 2	Roadside	E 376646 N821469	NO ₂	Y (5m)	< 2m	Y
Peterhead 1	Kerbside	E 413594 N 846066	NO ₂	Y (2m)	< 5m	Y
Peterhead 2	Kerbside	E 413209 N 846356	NO ₂	Y (2m)	< 5m	Y
Peterhead 3	Kerbside	E 412716 N 846734	NO ₂	Y (2m)	< 5m	Y
Peterhead 4	Kerbside	E 412758 N 846144	NO ₂	Y (2m)	< 5m	Y
Stonehaven 1	Kerbside	E 387445 N 785823	NO ₂	Y (2m)	< 5m	Y
Westhill 2	Kerbside	E 382118 N 806577	NO ₂	Y (2m)	< 5m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

Comparison of measured NO₂ concentrations with relevant air quality standards are discussed in Section 2.2.1.

2.2.1 Nitrogen Dioxide (NO₂)

Diffusion Tube Monitoring Data

The NO₂ diffusion tube monitoring data for 2012 is presented in Table 2.2. Raw data is presented in Appendix B (p35). NO₂ diffusion tube monitoring data for the previous 5 years is presented in Table 2.3, with a trend chart for this period presented in Figure 2.1.

QA:QC data in relation to NO₂ diffusion tube monitoring data is presented in Appendix C (p36).

Poor data capture is evident across all sites, with the exception of Stonehaven 1 where data capture was 100%. A combination of extreme weather events, changes in staff and missing tubes affected all other sites. There was a particular problem with vandalism of diffusion tubes, on a monthly basis, at Peterhead 4.

Recommendations in the generic Progress Report Template, provided on the DEFRA website¹¹ state that “*Where data capture is less than 75% of a full calendar year (less than 9 months), the mean should be “annualised”*”. Consequently, the measured mean of a 3 month monitoring period (with 100% data capture) for sites at Inverurie 1 and Peterhead 4 was annualised in accordance with instructions given in Box 3.2 of TG(09)¹². The annualisation ratio used in these calculations is described in Appendix C (p37) and is based on automatic urban background sites in Aberdeen City and Dundee City. These sites were used in the absence of any automatic urban background monitoring data within the Aberdeenshire Council area. Both sites are part of the national network, as recommended in the guidance with data capture above 90%.

The annualised mean data for the sites at Inverurie 1 and Peterhead 4 was subject to bias adjustment in the normal way and is presented alongside all other bias adjusted mean data in Table 2.2.

The highest recorded annual mean concentration continues to be observed at site Inverurie 1. This is a kerbside location on the busy B9170 close to the junction with the B9001 where there is a traffic light system in place. The road is the main shopping street in Inverurie and the junction is important for through traffic. In addition, there is a shopping area with large national retailers nearby accessed from the B9001 junction.

There were no exceedences of the NO₂ annual mean objective recorded in Aberdeenshire Council area during 2012.

Analysis of the presented data does not reveal any significant trend at any individual site or across Aberdeenshire as a whole.

Table 2.2 Results of NO₂ Diffusion Tubes 2012

Site ID	Location	Site Type	Data Capture 2012	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 = 0.83)
						2012 (µg/m ³)
Inverurie 1	West High St	Kerbside	8 months (67%)	Y	N	34.9 ^a
Inverurie 2	Gordon House	Roadside	9 months (75%)	N/A	N	8.9
Westhill 2	Elrick Cottages	Kerbside	9 months (75%)	N/A	N	22.3
Peterhead 1	Broad St	Kerbside	9 months (75%)	N/A	N	22.1
Peterhead 2	Queen St	Kerbside	9 months (75%)	N/A	N	29.3
Peterhead 3	Hay Crescent	Kerbside	9 months (75%)	N/A	N	25.5
Peterhead 4	Kirk St	Kerbside	5 months (42%)	Y	N	22.4 ^a
Stonehaven 1	Allardice St	Kerbside	12 months (100%)	N/A	N	23.8

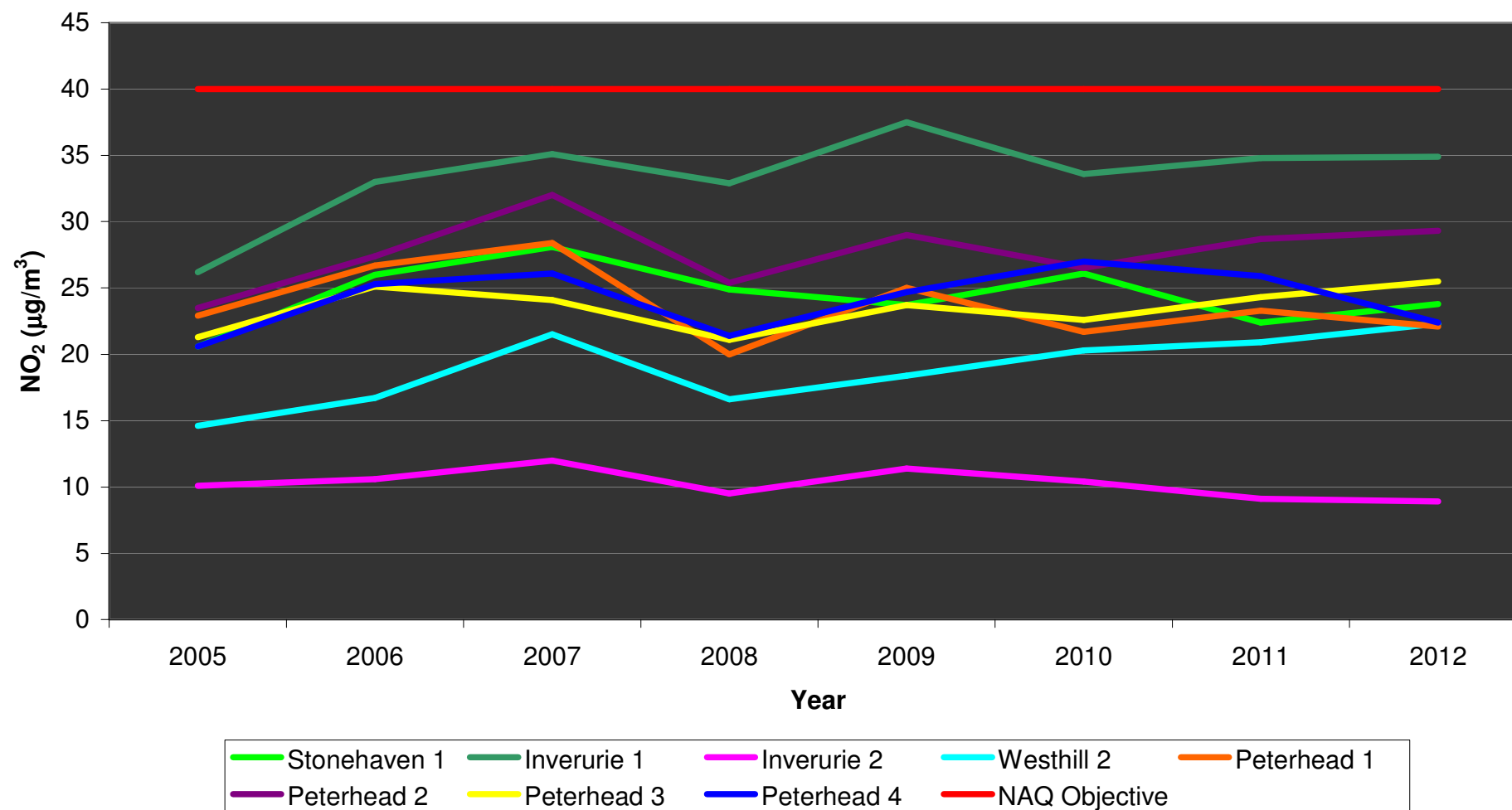
^a Means have been “annualised” as in Box 3.2 of TG(09)¹² where full calendar year data capture is less than 75%

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

Site ID	Location	Site Type	Annual mean concentration (adjusted for bias) µg/m ³				
			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 = 0.83)
Inverurie 1	West High St	Kerbside	32.9	37.5	33.6	34.8	34.9 ^a
Inverurie 2	Gordon House	Roadside	9.5	11.4	10.4	9.1	8.9
Westhill 2	Elrick Cottages	Kerbside	16.6	18.4	20.3	20.9	22.3
Peterhead 1	Broad St	Kerbside	20.0	25.0	21.7	23.3	22.1
Peterhead 2	Queen St	Kerbside	25.4	29.0	26.5	28.7	29.3
Peterhead 3	Hay Crescent	Kerbside	21.1	23.7	22.6	24.3	25.5
Peterhead 4	Kirk St	Kerbside	21.4	24.7	27.0 ^a	25.9	22.4 ^a
Stonehaven 1	Allardice St	Kerbside	24.9	23.7	26.1 ^a	22.4	23.8

^a Means have been “annualised” as in Box 3.2 of TG(09)¹² where full calendar year data capture is less than 75%

Figure 2.1: Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites 2005-2012



2.2.2 Particulate Matter (PM₁₀)

Aberdeenshire Council does not carry out any monitoring in respect of PM₁₀.

2.2.3 Sulphur Dioxide (SO₂)

Aberdeenshire Council does not carry out any monitoring in respect of Sulphur Dioxide.

2.2.4 Benzene

Aberdeenshire Council does not carry out any monitoring in respect of Benzene.

2.2.5 Other Pollutants Monitored

Aberdeenshire Council has not undertaken monitoring in respect of any other pollutant.

There were a total of 78 complaints received by Aberdeenshire Council during 2012 in regard to matters relevant to air quality. The 78 complaints comprised of the following;

- 27 regarding one event at Keenan Recycling Ltd
- 23 domestic bonfire complaints
- One large and 3 small domestic biomass plant
- 24 miscellaneous complaints

The event referred to at Keenan Recycling Ltd, New Deer involved a slow burning pile of woody material that had been recovered during recycling processes permitted under the PPC regime by SEPA. The fire began, accidentally, on 24 June 2012 and, on advice of Grampian Fire and Rescue Service, continued smouldering until February 2013. Clean up operations took place during February-March 2013. SEPA undertook monitoring of air quality for particulate matter (PM₁₀ and PM_{2.5}) around the site during the burning and clean up phases. There were no exceedences of AQS objectives observed during the event nor during the post event clean up.

The complaint regarding the large biomass plant relates to one x 700 kW boiler that is part of the district heating scheme at Hill of Banchory, Banchory. This plant was assessed during the Updating and Screening Assessment 2012. The complaint

arose as a result of the use of out of specification fuel and problems in the commissioning of the boiler; both issues have since been resolved. No further complaints have been received to date.

The remaining complaints relate to other transient, one-off events, some unsubstantiated.

None of the sources mentioned here are likely to have any significant long term effect on local air quality.

2.2.6 Summary of Compliance with AQS Objectives

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

3 New Local Developments

3.1 Road Traffic Sources

No new road traffic sources or areas of significantly changed traffic flow have been identified since the last Updating and Screening Assessment.

3.2 Other Transport Sources

No new transport sources have been identified since the last Updating and Screening Assessment.

3.3 Industrial Sources

Information on substantially changed industrial processes was requested from the Scottish Environment Protection Agency (SEPA). The information provided by SEPA states:

- SEPA is not aware of any changes that have been made to any existing PPC permitted process that will result in either positive or negative effect on local air quality
- SEPA is not aware of any regulated process where emissions to air have increased by more than 30%
- SEPA is not aware of any new developments within the Aberdeenshire Council area that are likely to have a significant impact on local air quality
- SEPA is not aware of any new mineral extraction processes that are likely to have a significant impact on local air quality
- SEPA is not aware of any new poultry units that are likely to significantly impact on local air quality
- One new petrol station has been identified where the annual throughput exceeds 2000 m³ of petrol. This site is at Asda, Huntly.

SEPA provided a list of PPC regulated processes that have ceased to operate over the past year. This information is detailed below in Table 3.1:

Table 3.1 Part A or B Processes That Have Ceased to Operate

Address	Type of Process
Victoria Filling Station, Banff	Petrol Station
Mains of Cairnbrogie, Oldmeldrum	Poultry Farm
Regency Filling Station, Ellon	Petrol Station
The Steamie, MacDuff	Laundry and Dry Cleaning
Davidson of Rora, Peterhead	Smelter

3.4 Commercial and Domestic Sources

A review of planning applications, building warrant applications and local knowledge has identified the following new biomass combustion plant, as listed in Table 3.2 below.

Table 3.2 Biomass plant identified in Aberdeenshire 2012

Location	Biomass Type	Capacity (kW)
Thistleycrook, Torphins	Wood Chip	80 kW
Kincausie House, Maryculter	unknown	unknown
Tarves Football Club, Tarves	Wood Pellet	199 kW
Lodge on the Loch, Aboyne	Wood Chip	50 kW
Mains of Schivas, Ythanbank	Wood Chip	195 kW
Peterhead Academy, Peterhead	unknown	unknown
Linnorie House, Huntly	Wood Log	60 kW
Aberdeen Arms, Tarland	Wood Pellet	67 kW
Kemnay Academy, Kemnay	unknown	unknown
Woodend, Lumphanan	unknown	unknown
Douneside House, Tarland	Wood Chip	2 x 195 kW
HM Prison Peterhead, Peterhead	unknown	unknown
Scottish Sculpture Workshop, Lumsden	unknown	unknown

Detailed information will be sought from the developers of the above sites and screening assessments completed. The results of the screening assessments will be reported in the next Updating and Screening Assessment, due 2015.

3.5 New Developments with Fugitive or Uncontrolled Sources

No significant new potential sources of fugitive or uncontrolled emissions have been identified since the previous Updating and Screening Assessment.

Aberdeenshire Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

- **Petrol Station, Asda, Huntly**
- **New biomass combustion plant (Listed in Table 3.2)**

These will be taken into consideration in the next Updating and Screening Assessment

4 Planning Applications

Planning applications been received for a major development in the Elsie area of Aberdeenshire. The masterplan proposes a “*New Settlement Comprising Residential (up to 4045 Dwellinghouses), Commercial, Retail and Community Facilities, with Associated Landscaping, Open Space, Drainage and Roads Infrastructure and Services*”. An air quality assessment of the impact of the development, as a whole, was requested and has been submitted by the applicant.

The major source of emissions in regard to this development is transport. The air quality impact assessment considered the impact of this source adequately and no exceedences of air quality objectives are predicted.

The proposals also include the development of a biomass energy centre. This source was included in the air quality impact assessment, however further details have been requested from the developer in relation to particulate emissions. Consequently, this potential source is still under consideration.

Other planning applications received where potential for some impact on local air quality has been identified includes one application for a new quarry site at Bridgend, Longside, Peterhead. This proposal relates to a small quarry site where dust mitigation measures have been proposed and accepted. No exceedences of air quality objectives are predicted.

Planning applications have been received in respect of some of the biomass plant listed in Table 3.2 (p20) of this report. Screening assessments have been completed for those that have gone through the planning system. No exceedences of air quality objectives are predicted. The results of the screening assessments will be reported in the next Updating and Screening Assessment, due 2015, as requested.

5 Local Transport Plans and Strategies

Aberdeenshire Council published its fourth Local Transport Strategy (LTS) in 2012. Drawing upon lessons learned from previous transport strategies and taking into account the challenges we face today, the LTS embraces a simple guiding principle. The LTS will aim to encourage individuals and businesses to consider ways to travel less, travel more actively and, where vehicular travel is necessary, how journeys could be made more effectively.

The Local Transport Strategy 2012 is available at the following link:

<http://www.aberdeenshire.gov.uk/transportation/lts/index.asp>

6 Climate Change Strategies

Aberdeenshire Council remains committed to reducing carbon emissions and to government initiatives on climate change. A summary of climate change actions and reports can be found at the following link:

<http://www.aberdeenshire.gov.uk/green/greenhouse.asp>

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

The new monitoring data demonstrates that concentrations of NO₂ in Aberdeenshire continue to remain below AQS objectives.

No AQMAs have been declared in the Aberdeenshire Council area and no requirement for detailed assessment has been identified.

7.2 Conclusions relating to New Local Developments

Aberdeenshire Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

- Petrol Station, Asda, Huntly
- New biomass combustion plant (listed in Table 3.2)

These will be taken into consideration in the next Updating and Screening Assessment, scheduled for 2015.

7.3 Other Conclusions

Aberdeenshire Council received a number of complaints during 2012 in regard to matters relevant to air quality.

SEPA undertook monitoring for particulates with respect to one particular event at Keenan Recycling Ltd which gave rise to 35% of the complaints received. No exceedences of the air quality objectives for PM₁₀ were observed during the event or during the clean up phase.

None of the sources that gave rise to the other logged complaints are likely to have any significant long term impact on local air quality.

7.4 Proposed Actions

The new monitoring data has been considered and a review of new developments undertaken. It is concluded there is no requirement to proceed to a Detailed Assessment for any pollutant at this time. However, Aberdeenshire Council will continue to monitor NO₂ levels at the existing sites. Furthermore, additional NO₂ diffusion tubes have been set up within Ellon, as proposed in the previous Updating and Screening Assessment¹⁰.

In terms of new biomass development, Aberdeenshire Council will continue to identify and collate technical information regarding biomass installations for which details are submitted under the planning regime, and will also continue to seek, identify and collate technical information for those installations not controlled by the planning regime but where there may be an impact on local air quality. This information will be held in an inventory of known biomass installations throughout the Aberdeenshire Council area.

Where necessary, Aberdeenshire Council will carry out screening assessments of new biomass installations and report results in the next Updating and Screening Assessment, scheduled for 2015.

Aberdeenshire Council intends to present information on the progress of these actions in the Progress Report due for submission in 2014.

8 References

- 1 Aberdeenshire Council, *Air Quality Updating and Screening Assessment for Aberdeenshire Council 2003 for Aberdeenshire Council*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, July 2003
- 2 Aberdeenshire Council, *Local Air Quality Management Progress Report 2004*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, April 2004
- 3 Aberdeenshire Council, *Local Air Quality Management Progress Report 2005*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, April 2005
- 4 Aberdeenshire Council, *Air Quality Updating and Screening Assessment 2006 for Aberdeenshire Council*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, August 2006
- 5 Aberdeenshire Council, *Local Air Quality Management Progress Report 2007*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, April 2007
- 6 Aberdeenshire Council, *Local Air Quality Management Progress Report 2008*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, April 2008
- 7 Aberdeenshire Council, *Air Quality Updating and Screening Assessment 2009 for Aberdeenshire Council*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, July 2009
- 8 Aberdeenshire Council, *Local Air Quality Management Progress Report 2010*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, July 2010
- 9 Aberdeenshire Council, *Local Air Quality Management Progress Report 2011*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, June 2011
- 10 Aberdeenshire Council, *Air Quality Updating and Screening Assessment 2012 for Aberdeenshire Council*, available at <http://www.aberdeenshire.gov.uk/environmental/atmosphere.asp>, September 2012
- 11 Department for Environment, Food and Rural Affairs: London, *Local Air Quality Management Support, Report Templates*, available at <http://laqm.defra.gov.uk/review-and-assessment/report-templates.html>, June 2013
- 12 Department for Environment, Food and Rural Affairs: London, *Local Air Quality Management Technical Guidance LAQM.TG(09)* (PB13215 February 2009)

Appendices

Appendix A: Maps of Non-Automatic Monitoring Sites

Appendix B: Diffusion Tube Raw Data

Appendix C: QA:QC Data

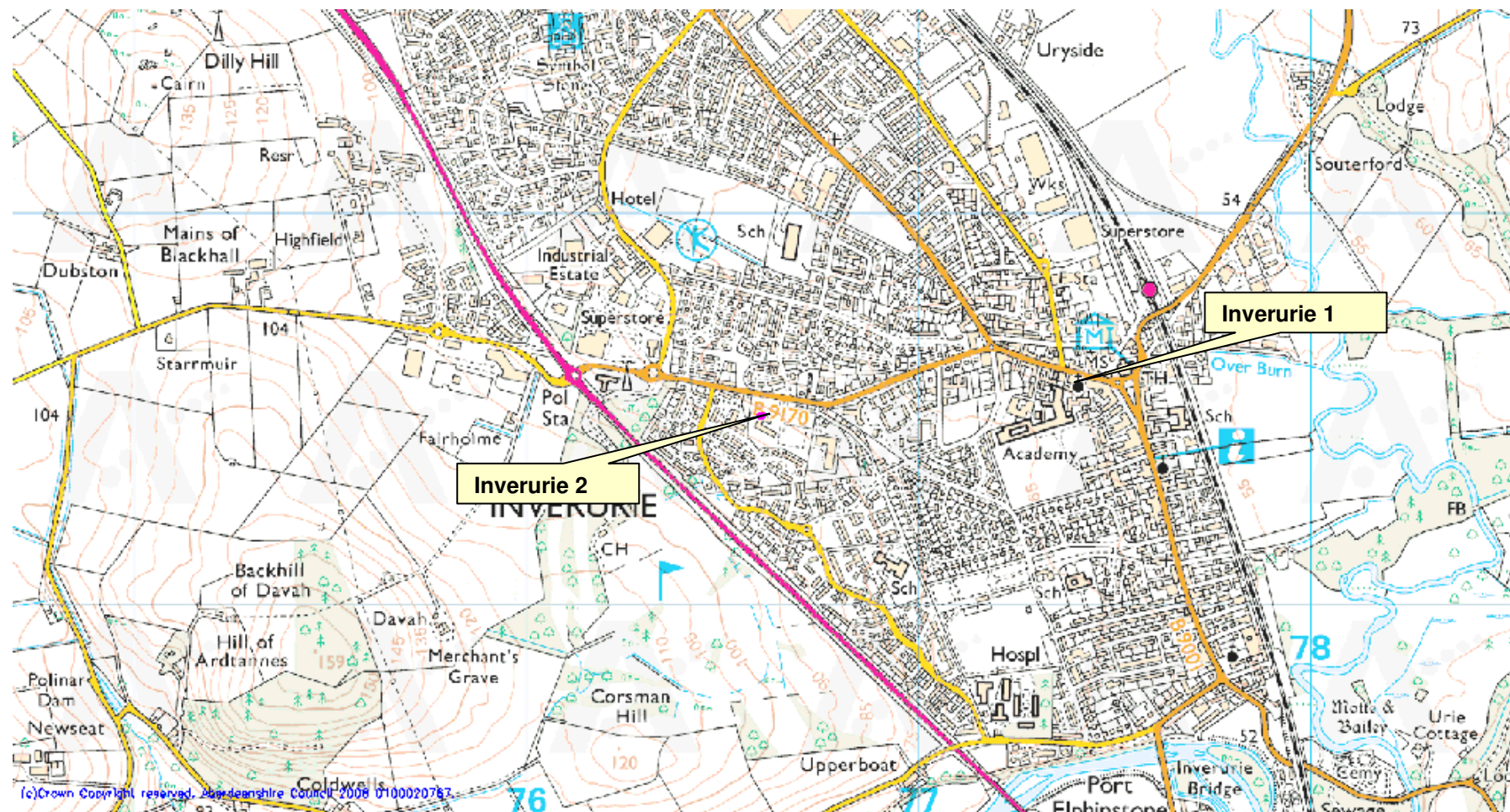
Appendix A: Maps of Non-Automatic Monitoring Sites

- Map A.1** **Settlements in Aberdeenshire where NO₂ Diffusion Tube Monitoring was undertaken during 2012**
- Map A.2** **Location of NO₂ Diffusion Tube Sites (Inverurie)**
- Map A.3** **Location of NO₂ Diffusion Tube Sites (Peterhead)**
- Map A.4** **Location of NO₂ Diffusion Tube Sites (Stonehaven)**
- Map A.5** **Location of NO₂ Diffusion Tube Sites (Westhill)**

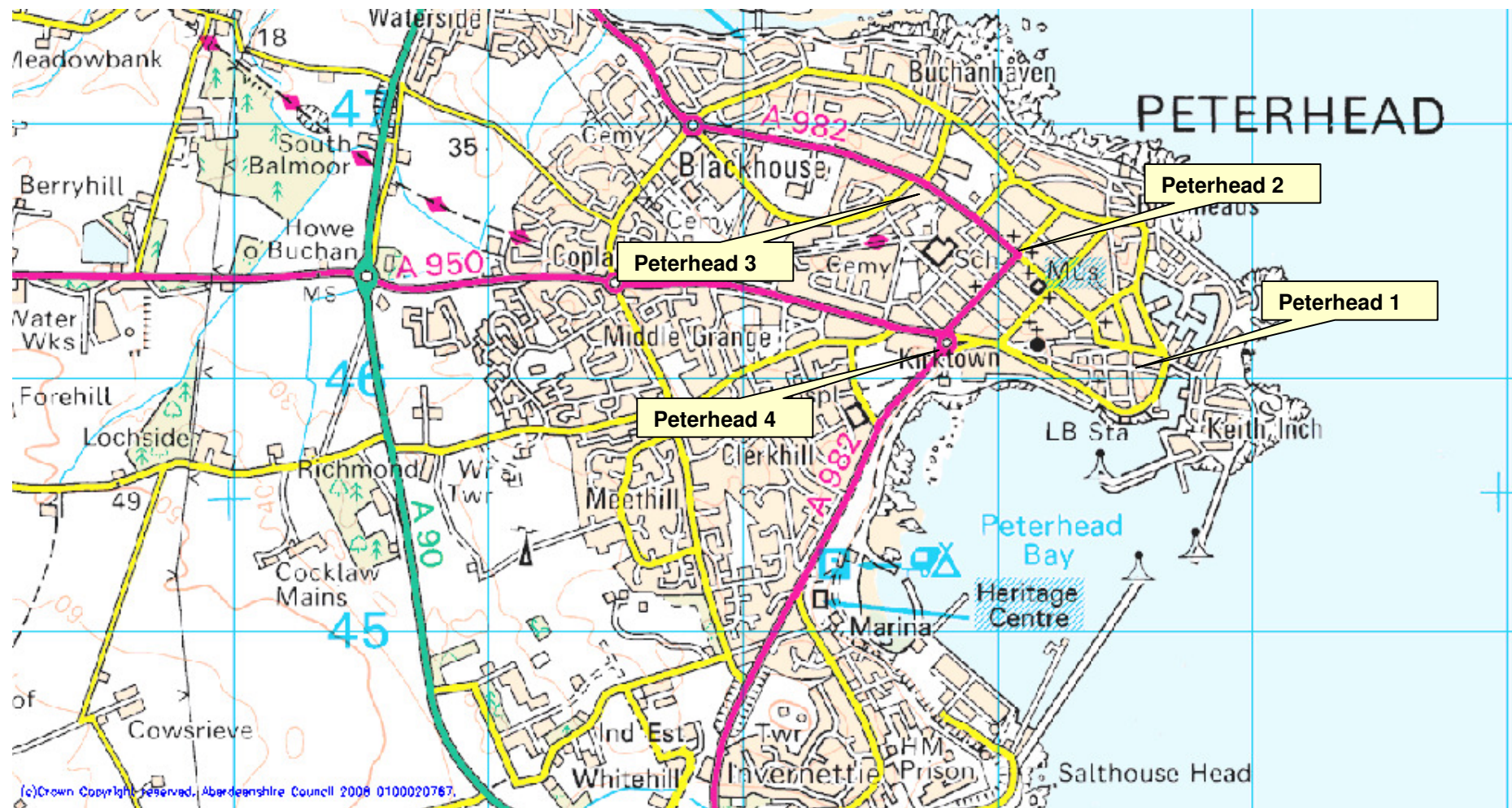
Map A.1 Settlements in Aberdeenshire where NO₂ Diffusion Tube Monitoring was undertaken during 2012



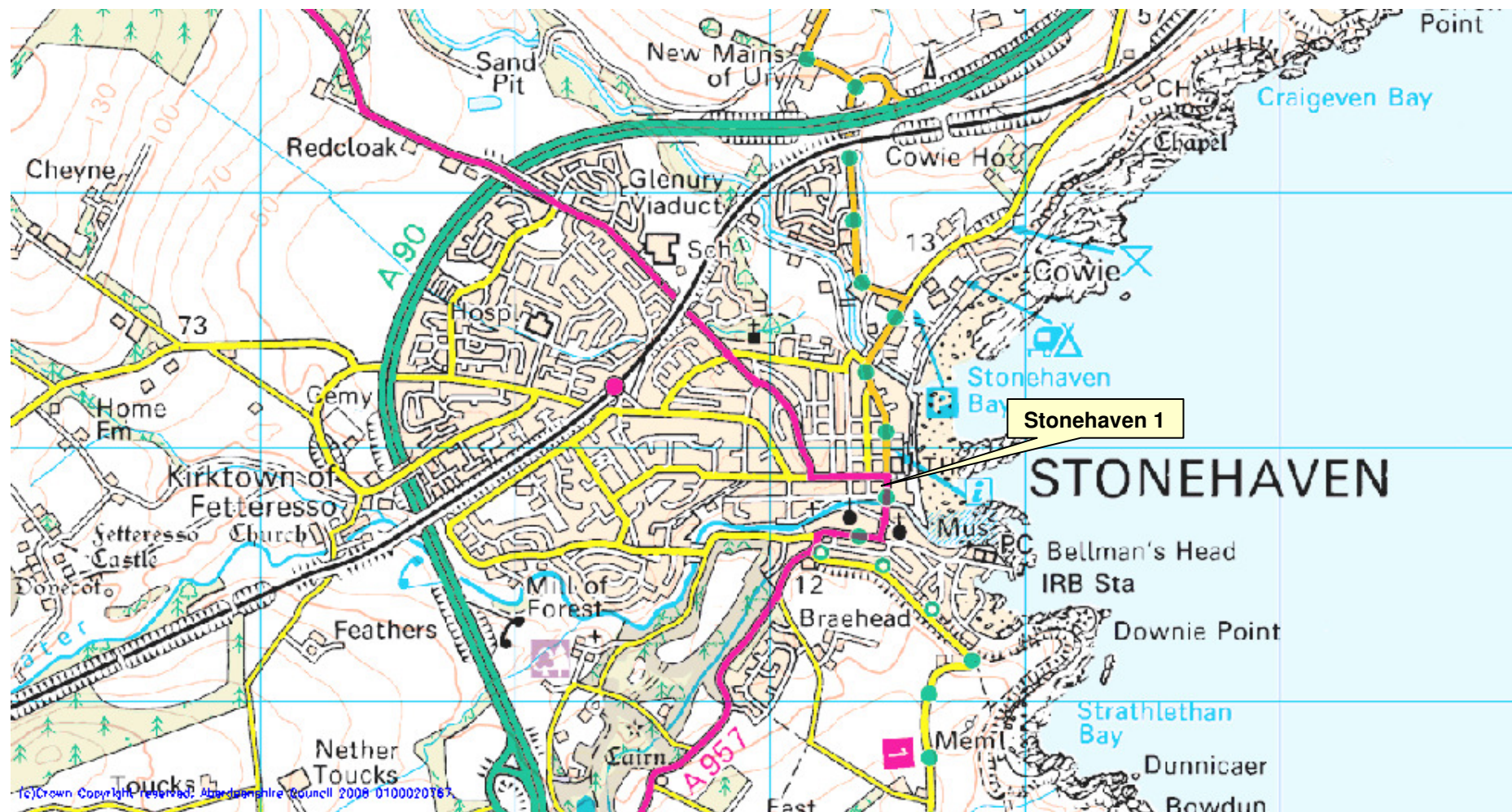
Map A.2 Location of NO₂ Diffusion Tube Sites (Inverurie)



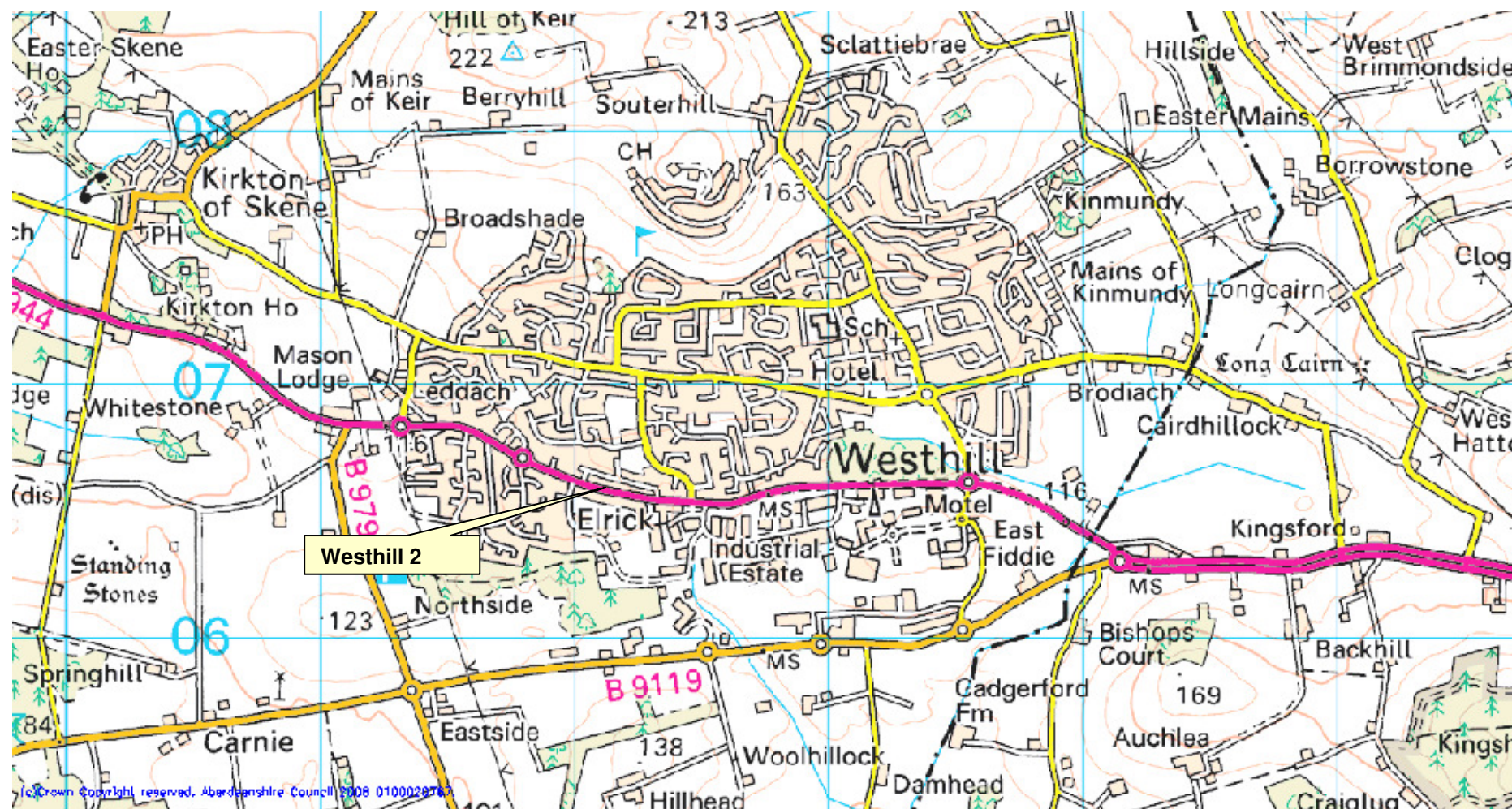
Map A.3 Location of NO₂ Diffusion Tube Sites (Peterhead)



Map A.4 Location of NO₂ Diffusion Tube Sites (Stonehaven)



Map A.5 Location of NO₂ Diffusion Tube Sites (Westhill)



Appendix B: Diffusion Tube Raw Data

Table B.1: Raw Nitrogen Dioxide Diffusion Tube Data from Periods 1-12 in Year 2012

	Period (2011)											
Site ID	1	2	3	4	5	6	7	8	9	10	11	12
Inverurie 1	N/A	N/A	51	30	29	30	28	N/A	38	42	54	N/A
Inverurie 2	N/A	N/A	15	10	8	7	6	8	9	15	19	N/A
Peterhead 1	28	24	31	18	19	N/A	N/A	30	27	26	37	N/A
Peterhead 2	30	35	38	30	33	N/A	N/A	44	37	32	39	N/A
Peterhead 3	36	35	36	24	26	N/A	N/A	28	22	31	39	N/A
Peterhead 4	36	33	37	28	N/A	N/A	N/A	N/A	N/A	N/A	37	N/A
Stonehaven 1	29	27	31	36	37	33	25	26	19	26	27	28
Westhill 2	N/A	N/A	26	30	28	29	22	24	23	29	31	N/A

Key:

	Tube lost , contaminated, or unobtainable due to scaffolding etc
	Exposure period too long or too short (by a factor greater than +/- 2 days)
	Valid data

Appendix C: QA:QC Data

Factor from Local Co-location Studies (if available)

Aberdeenshire Council does not undertake any co-location studies.

Diffusion Tube Bias Adjustment Factors

Laboratory analysis of passive diffusion tubes used by Aberdeenshire Council is undertaken by Aberdeen Scientific Services (Aberdeen City Council). Aberdeen Scientific Services is a UKAS accredited laboratory with documented Quality Assurance/Quality Control (QA/QC) procedures for diffusion tube analysis. The laboratory prepares the diffusion tubes using the 20% triethanolamine (TEA) in water method.

The 2012 bias adjustment factor for Aberdeen Scientific Services was obtained from the National Diffusion Tube Bias Adjustment Spreadsheet, version 03/13 (available at http://laqm.defra.gov.uk/documents/Database_Diffusion_Tube_Bias_Factors-v03_13-Final.xls) and is presented in Table C.1.

Table C.1 Details of 2012 Bias Adjustment Factors for Aberdeen Scientific Services (Aberdeen City Council)

Laboratory	Method	Year	Version 03/13		
			No. Studies Added	Total No. of Studies	Bias Adjustment Factor
Aberdeen Scientific Services	20% TEA in water	2012	1	1	0.83

QA/QC of diffusion tube monitoring

The National Diffusion Tube Bias Adjustment Spreadsheets, version 03/13 (available at http://laqm.defra.gov.uk/documents/Tube_Precision_2013_version_03_13-Final.pdf), present Tube Precision for Aberdeen Scientific Services as **GOOD**.

Aberdeen Scientific Services (Aberdeen City Council) participates in the WASP scheme, and have **100% SATISFACTORY** score from the last 8 rounds (R113-120) of the scheme.

Short-term to Long-term Data adjustment

There were 2 sites (Inverurie 1 and Peterhead 4) where the annual data capture was below 75% and consequently the captured data for these sites was subject to annualisation as per the instructions given in Box 3.2 of TG(09)¹².

Sites chosen to obtain the annualisation ratio are detailed in Table B.2 and B.3, below. For Inverurie 1, the data period chosen to obtain the ratio was March-May as recommended in Annex 1 of TG(09)¹². The limited amount of data available at Peterhead 4 however, meant that recommendations in TG(09)¹² could not be followed and thus the period January-March was chosen to present a worst case scenario.

Table C.2 Annualisation Ratio Data For Inverurie 1: (March-Apr-May)

Site	Site Type	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio (AM/PM)
Aberdeen Errol Place	Urban Background	21.0	19.3	1.088
Dundee Mains Loan	Urban Background	10.0	8.3	1.205
			Average	1.146

Table C.3 Annualisation Ratio Data For Peterhead 4: (Jan-Feb-March)

Site	Site Type	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio (AM/PM)
Aberdeen Errol Place	Urban Background	21.0	29.0	0.724
Dundee Mains Loan	Urban Background	10.0	12.7	0.787
			Average	0.755