

Annual Progress Report (APR)

Aberdeenshire
COUNCIL



2018 Air Quality Annual Progress Report (APR) for
Aberdeenshire Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June 2018

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Executive Summary: Air Quality in Our Area

Air Quality in Aberdeenshire

Aberdeenshire Council is located on the north-east coast of Scotland and surrounds the Aberdeen City Council area. 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, eastern and southern parts of the Council area are somewhat less mountainous with large expanses of agricultural land, coastal grassland and a greater density of small towns.

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 Aberdeenshire Council area enjoys good air quality with no exceedances of the national air quality objectives. Consequently there is no requirement for Aberdeenshire Council to declare any air quality management areas (AQMAs).

Actions to Improve Air Quality

Aberdeenshire Council is working with internal and external partners to deliver the objectives of Cleaner Air for Scotland – The Road to a Healthier Future (CAFS).

For the first time, Aberdeenshire Council participated in Clean Air Day on 21 June 2018 setting up an information stall within the council headquarters and posting messages on social media to raise awareness and provide advice for colleagues, residents and friends on how to improve our air quality, and increase active travel.

Local Priorities and Challenges

There are a large number of biomass installations within the Aberdeenshire area, including many in our rural communities on agricultural holdings. Aberdeenshire Council are currently working with the agricultural sector, providing advice and expertise, and to identify these biomass installations ensuring the appropriate authorisations are obtained where necessary.

Aberdeenshire Council will continue to review and assess local air quality in accordance with the statutory monitoring and reporting requirements.

How to Get Involved

For further information on Air Quality in Aberdeenshire, including information on how to obtain previous annual LAQM reports and a link to the Scottish air pollution forecast please visit the air quality section of our website, or follow our social media feeds:

<https://www.aberdeenshire.gov.uk/environment/environmental-protection/atmospheric-pollution/>

Facebook: Aberdeenshire Council

Twitter: @Aberdeenshire

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1. Local Air Quality Management

This report provides an overview of air quality in Aberdeenshire Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Progress Report (APR) summarises the work being undertaken by Aberdeenshire Council to improve air quality and any progress that has been made.

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO ₂)	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)	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
Particulate Matter (PM _{2.5})	10 µg/m ³	Annual mean	31.12.2020
Sulphur dioxide (SO ₂)	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
Benzene	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	10.0 mg/m ³	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/m ³	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

Aberdeenshire Council currently does not have any AQMAs.

Table 2. 1 Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Crow's Nest, Banchory Phase 1	Promoting low emission plants	Landfill gas captured and turned into electricity through installation of a 50kW turbine engine.	Infrastructure Services (Waste)	Completed	Completed	The landfill gas is no longer flared, instead it now provides free electricity to the site.	N/A	Completed.	30 th March 2017	This is the first of a three phase approach to creating a 'zero energy' depot facility.
2	Crow's Nest, Banchory Phase 2	Promoting low emission plants	Capture the heat from the turbine exhaust to channel it to heat a welfare unit for 35 staff.	Infrastructure Services (Waste)	On-going	Awaiting depot construction.	Currently the heat (around 95kW/h) escapes. This will be captured and utilised.	N/A	Depot under construction.	End 2018	The site will become self-sustaining.
3	Crow's Nest, Banchory Phase 3	Promoting low emission plants	Heating of the leachate pond.	Infrastructure Services (Waste)	On-going	Awaiting completion of phase 2.	Leachate will no longer require to be tinkered off for treatment due to cold temperatures preventing the microbes from processing the leachate.	N/A	Awaiting completion of phase 2.	Awaiting completion of phase 2.	No longer require tanker movements to remove the leachate.

Aberdeenshire Council

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
4	Installation of telematics to the Council Fleet	Vehicle fleet efficiency	Promotion of better, more efficient driving. Identification of unnecessary journeys.	Infrastructure Services (Fleet)	On-going	End 2018	Reduction in business miles.		Partial installation.	End 2018.	Increase staff awareness regarding vehicle use.
5	Use of a hybrid refuse vehicle	Vehicle fleet efficiency	Improve fleet efficiency and reduction in heavy fuel consumption.	Infrastructure Services (Fleet)	On-going	End 2018	Reduction in heavy fuel consumption.		Vehicles on order.	End 2018.	Reduction in NOx.

2.2 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland’s legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available at <http://www.gov.scot/Publications/2015/11/5671/17>. Progress by Aberdeenshire Council against relevant actions within this strategy is demonstrated below.

2.3 Transport

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan.

Aberdeenshire Council has an Integrated Travel Town project, supported by Sustrans and Paths for All, details of which can be found at <http://www.aberdeenshire.gov.uk/roads-and-travel/transportation/integrated-travel-towns/>

The project currently includes draft masterplans for the towns Ellon, Fraserburgh, Huntly, Inverurie and Portlethen. The main aim of the project is to help support more sustainable and active travel in these towns.

Buchan House in Peterhead was opened in 2015 as a new office facility in Peterhead. It was designed to bring multiple services together and saw the closing of several small outlying offices. There was a corporate travel plan developed to support staff in making informed choices when travelling to and from the new building.

2.4 Climate Change

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered. Aberdeenshire Council has a partnership agreement with Aberdeen City, Moray and Angus Council who together form the North East Scotland Sustainable Energy Action Plan (NESSEAP).

The Environmental and Climate Change Policy sets out ways in which the council will fulfil its commitment to sustainable development and safeguarding the environment it was first approved in November 2016.

It commits the council to leading by example in reducing the impact that its services and functions have on the environment and climate change. This means reducing our greenhouse gases emitted in the provision of services, conserving our natural resources and enhancing the region's biodiversity to improve the health and well-being of Aberdeenshire residents.

As part of the council's commitment to climate change mitigation, the first Carbon Budget was set for 2017/18. The new approach, approved at full council in February 2017, will encourage the whole council to fundamentally consider how it is run and the resulting carbon implications. Aberdeenshire is the first local authority in Scotland to implement such a budget.

3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

3.1.1 Automatic Monitoring Sites

Aberdeenshire Council does not operate any automatic analysers or monitors in respect of the identified LAQM pollutants.

3.1.2 Non-Automatic Monitoring Sites

Aberdeenshire Council undertook non- automatic (passive) monitoring of NO₂ at 17 sites during 2017. Table B.1 in Appendix B shows the full details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix A. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendices B and C.

3.2.1 Nitrogen Dioxide (NO₂)

Table B.2 in Appendix B compares the adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Longer term trends and historical data are presented in Figures B.1 and B.2 in Appendix B.

The full 2017 dataset of monthly mean values is provided in Table B.3 of Appendix B.

A full audit of diffusion tube locations has been carried out to improve site characterisation and knowledge of locations. As there are no exceedances of the air quality objective it has not been considered necessary to apply distance correction to obtain concentrations at nearby relevant receptors for any diffusion tube site.

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

3.2.2 Particulate Matter (PM₁₀)

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

3.2.3 Particulate Matter (PM_{2.5})

Aberdeenshire Council does not carry out any monitoring in respect of PM_{2.5} and there are no current plans to do so in future years.

3.2.4 Sulphur Dioxide (SO₂)

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

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

Aberdeenshire Council does not carry out any monitoring in respect of Carbon Monoxide, Lead and 1,3-Butadiene.

4. New Local Developments

4.1 Road Traffic Sources

Construction began in 2015 of the Aberdeen Western Peripheral Route and the dualling of the A90 between Balmedie and Tippetty. This work has been on-going throughout 2017.

Annual Average Daily Traffic (AADT) Count data has not been considered this year due to the abnormal and transient changes in traffic flow as a result of the AWPR construction works and consequent (daily, weekly, monthly) traffic diversions. There is a Strategic Transport Appraisal on-going to consider further transport interventions that may be required once the Aberdeen Western Peripheral Route has been completed. The conclusions of the Strategic Transport Appraisal and settled AADT Count data will be considered in subsequent Annual Progress Reports

Aberdeenshire Council confirms there are no newly identified air pollutant sources attributable to the transport sources listed below:

- Narrow congested streets with residential properties close to the kerb
- Busy streets where people may spend one hour or more close to traffic
- Roads with a high flow of buses and/or HGVs
- Junctions
- New roads constructed or proposed
- Roads with significantly changed traffic flows
- Bus or coach stations

4.2 Other Transport Sources

Aberdeenshire Council confirms that the following transport sources within the local authority boundary do not meet the criteria specified in the Local Air Quality Management, Technical Guidance (TG16)⁴ that would trigger the requirement for a more detailed assessment:

- Airports.
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.
- Ports for shipping.

Peterhead Port saw five cruise liners visit in 2017, this was an increase of three from the 2016 figure of two cruise liners.

4.3 Industrial Sources

All significant industrial processes in Scotland are regulated by the Scottish Environment Protection Agency (SEPA). Information was sought from SEPA regarding any new or significantly changed industrial processes with potential for significant emissions to air. Ongoing construction works, including some Part B PPC activities, at the Aberdeen Western Peripheral Route – Balmedie to Tippetty project are identified by SEPA as potential sources of fugitive emissions. Dust monitoring and control systems are in place as reported in previous Annual Progress Reports. These works are expected to be completed in the latter half of 2018.

No other significant industrial sources have been identified.

4.4 Commercial and Domestic Sources

All new or proposed biomass or CHP installations identified in 2017, through the planning system, are listed in Table 4.1.

Table 4.1 Biomass or CHP plant identified in Aberdeenshire in 2017

Location	Biomass Type	Capacity (kW)
Meikle Whiterashes, Turriff	Straw boiler	2 x 295
Site West of Cookney Ridge.Netherley	unknown	unknown
Cairnandrew, Banff	CHP	18 x 165
Brunstone Farmhouse, St Katherines	Straw boiler	3 x 295
Craigshowdie, Peterhead	unknown	unknown
Chapelton of Elsick, Newtonhill	CHP	unknown
Whiteside, Fraserburgh	Mixed clean waste wood and wood chip	2 x 175 1 x 195 2 x 210 3 x 295
Millfield House, Cuminestown	Straw boiler	295
Whitewell Works, Fraserburgh	unknown	unknown
Upper Pitforthie, Stonehaven	Wood chip	198
Kinnoir Sawmill, Huntly	Wood chip	2 x 1400
Boghead Farm, Sandhaven	unknown	unknown
Keilhill, Banff	CHP	3000
Whitecairns Farm, New Deer	unknown	unknown
Bogton, Huntly	unknown	210
Glenglassaugh Workshop, Portsoy	unknown	unknown
Coulterfanny. Fraserburgh	unknown	unknown
Crossbrae, Fraserburgh	unknown	unknown
East Ardarg, Ellon	Wood chip	210
Castleton, Fordoun	Wood chip	1 x 2000 4 x 990
Castleton, Fordoun	CHP	3 x 45

Aberdeenshire Council are aware of a number (twelve) of straw/mixed wood fuelled biomass installations in (mainly) agricultural holdings that have not been through the planning process (to date); consequently only limited information is currently available and no screening assessments have yet been carried out. Aberdeenshire

Council is currently seeking information about each of these unauthorised developments and planning applications will be sought where necessary.

Information is still required for a number of sites listed in the annual reports for 2015, 2016 and 2017 to enable screening assessments to be undertaken. Screening assessments for these previously identified sites will be carried out in due course if and when the relevant information is received.

4.5 New Developments with Fugitive or Uncontrolled Sources

There are various quarrying, extraction, landfill and waste management sites located throughout Aberdeenshire which have the potential to give rise to fugitive dust emissions (in addition to those listed in Chapter 5). Where it has been appropriate and possible to do so, conditions have been placed on planning consents relating to such sites in order to minimise the dust emissions from these sites. Additionally, some such sites are regulated by SEPA under the PPC regime.

Furthermore, the ongoing construction of the new Aberdeen Western Peripheral Route and the dualling of the A90 between Balmedie and Tipperty has potential for release of particulate matter arising from various construction activities such as use of exposed soil routes, blasting, crushing and screening of rock and aggregates, etc. Dust suppression measures are used where appropriate and certain activities are subject to SEPA regulation under the PPC regime. Construction is expected to be completed later in 2018.

There were a total of 100 complaints logged by Aberdeenshire Council during 2017 in regard to matters relevant to air quality, comprising of;

Agricultural activities

- 4 complaints about farm manure odour
- 5 complaints about odour from agricultural spreading/land at 4 locations
- 4 complaints about burning agricultural waste
- 1 complaint about odour from agricultural housing

Biomass installations

- 17 complaints about smoke and/or odour related to biomass boilers at 12 (mostly agricultural) locations
- 10 complaints (4 re wood stoves) about smoke from domestic chimney/flue at 8 locations

Bonfires and burning

- 10 complaints about burning waste in/on commercial property at 9 locations
- 3 complaints about bonfires on construction sites
- 18 complaints about domestic garden bonfires and 4 requests for advice

Non-agricultural odour

- 1 complaint about cigarette smoke affecting property
- 10 complaints about odours from commercial premises (4 about cooking odours, 4 about waste processes)
- 4 complaints about odour from a domestic source (one composting bin and one wood burner, 2 outdoor smoking of food)
- 6 complaints about dust from construction or demolition activities

General emissions to air

- 7 concerns about asbestos fibre release to air
- 1 complaint about vehicle idling

With the exception of the 17 complaints about biomass installations, all of these complaints are transient and any significant impact on air quality is unlikely.

The complaints related to biomass installations are all currently subject to ongoing investigation. It is proposed to develop a GIS map layer of all known biomass sites in the Aberdeenshire Council area to enable better spatial awareness of potential impacts of emissions to air. Information is also being sought about unauthorised biomass development to enable screening assessments (as a minimum) to be undertaken.

5. Planning Applications

Planning applications relating to new biomass installation are discussed in Chapter 4.

There were 5 planning applications for residential or mixed use development submitted to Aberdeenshire Council in 2017, which remain active

- Residential development, Cruden Bay (200 houses)
- Residential development, Chapelwell, Balmedie South (220 houses)
- Residential development, Castle Park, Aboyne (180 houses)
- Mixed use development, Portstown, Inverurie (416 houses)
- Mixed use development, Nether Aden, Mintlaw (500 houses)

Although the above developments, in isolation, are not considered to have significant detrimental impact on local air quality they are recorded here should any potential cumulative impacts require consideration in future.

There were 3 planning applications for new quarrying operations or extensions to existing quarry operations in 2017:

- Methlick Quarry, Methlick
- Muirtack Quarry, Ellon
- Boyne Bay Quarry, Boyndie

Planning consents for new or extended quarrying developments generally contain a requirement, through planning conditions, for dust suppression measures to be in place.

There was one planning application (granted approval) for additional sheds to house poultry at the existing PPC permitted Lower Smiddyseat farm, near Turriff. This is subject to a variation of the existing PPC permit in respect of emissions to air. To date, it is understood that this planning permission has not been realised nor has any application to vary the existing PPC permit been received by SEPA.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

New diffusion tube monitoring sites have been set up in Banff and Oldmeldrum in 2017 as reported in the 2017 Annual Report. The diffusion tube monitoring data presented in Chapter 3 and Appendix B demonstrates that concentrations of NO₂ in Aberdeenshire continue to remain below the national air quality objectives.

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

6.2 Conclusions relating to New Local Developments

Transport Sources

Airports, railways and ports have been considered. There are no significant changes since the previous Annual Report in 2017. Road transport sources will be considered in subsequent Annual Reporting rounds following the expected opening of the Aberdeen Western Peripheral Route, later in 2018.

There are no current or projected exceedances of relevant national air quality objectives.

Industrial Sources

Industrial sources were considered following receipt of information from SEPA and consideration of planning applications received by Aberdeenshire Council.

No industrial sources have been identified that are likely to have significant impact on national air quality objectives.

Commercial and Domestic Sources

A large number of new biomass installations has been identified. Additional information is required to complete screening assessments for many of these new biomass installations and investigations into complaints of smoke from these installations are ongoing.

Fugitive or Uncontrolled Sources

Potential fugitive or uncontrolled sources of emissions are unlikely to be significant in respect of the national air quality objectives.

6.3 Proposed Actions

Diffusion Tube Monitoring Data

Whilst concentrations of NO₂ at all diffusion tube sites are below the national objective, examination of long term diffusion tube data suggests that monitoring should continue at 3 sites in Inverurie, Westhill, 2 sites in Ellon, Oldmeldrum, 4 sites in Peterhead and Banff until a further review at the end of 2018. It is proposed to cease monitoring at Inverurie 21HS as trend data shows Inverurie MC is an appropriate site for measurement of traffic sources in this location, and Ellon 4 due to consistently low results. Monitoring ceased at Peterhead MC, Peterhead SR and Inverbervie during 2017, due to consistently low results.

Transport Sources

Road transport sources and port sources will be considered in subsequent Annual Reporting rounds following completion of major road infrastructure projects and the harbour expansion at Peterhead.

Commercial and Domestic Sources

Information will be sought in respect of biomass installations where sufficient information has not yet been provided. Investigation of complaints relating to new biomass developments is ongoing. Screening assessments will be completed in due course following receipt of the required information. An update on biomass installations in Aberdeenshire will be provided in the next Annual Report in 2019.

Aberdeenshire Council intends to submit an Annual Progress Report in 2019.

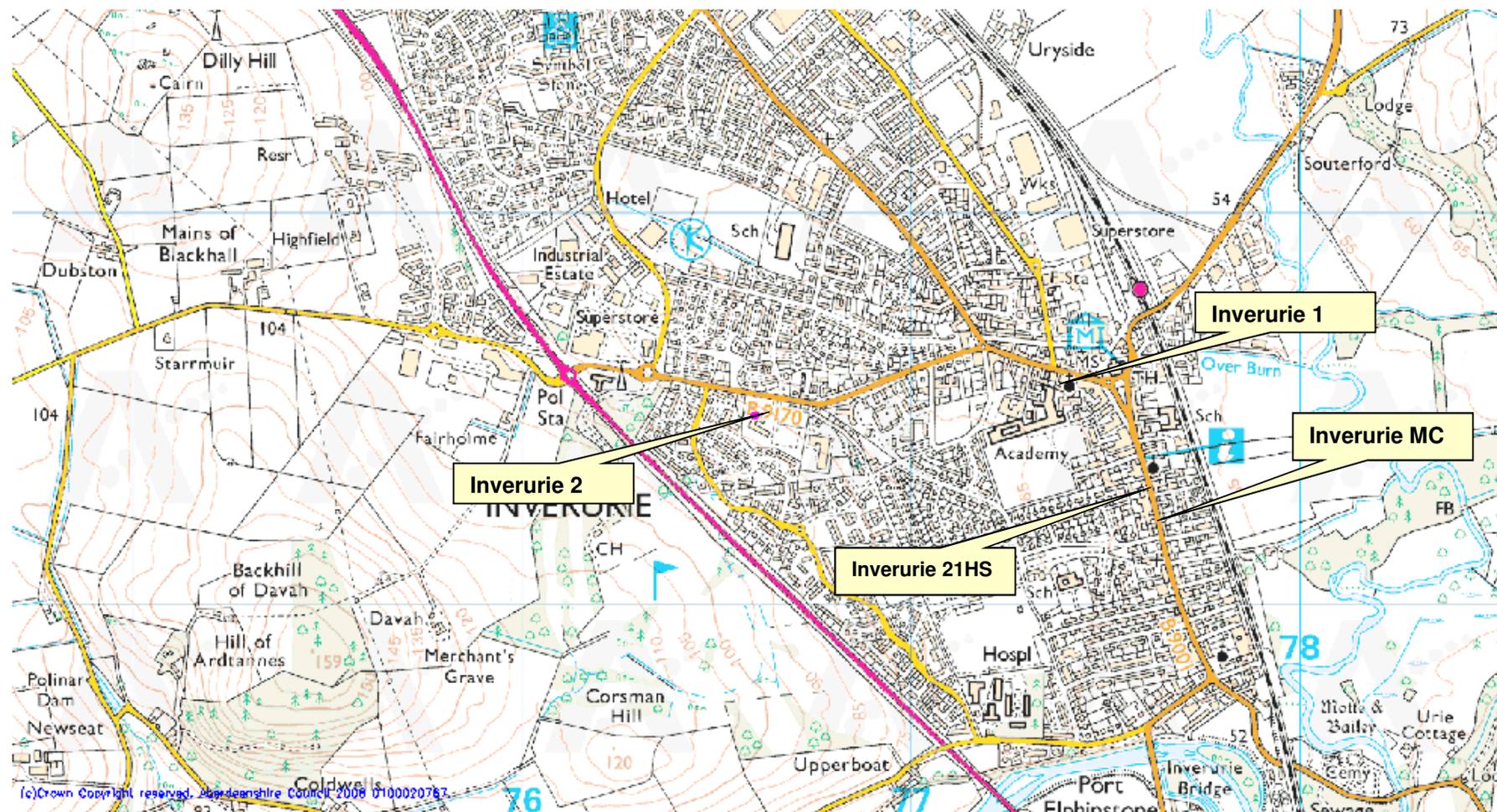
Appendix A: Maps of Non-Automatic Monitoring Sites

- Map A.1** **Settlements in Aberdeenshire where NO₂ Diffusion Tube Monitoring was undertaken during 2017**
- 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 (Westhill)**
- Map A.5** **Location of NO₂ Diffusion Tube Sites (Ellon)**
- Map A.6** **Location of NO₂ Diffusion Tube Site (Inverbervie)**
- Map A.7** **Location of NO₂ Diffusion Tube Site (Oldmeldrum)**
- Map A.8** **Location of NO₂ Diffusion Tube Site (Banff)**

Map A.1 Settlements in Aberdeenshire where NO₂ Diffusion Tube Monitoring was undertaken during 2017



Map A.2 Location of NO₂ Diffusion Tube Sites - Inverurie

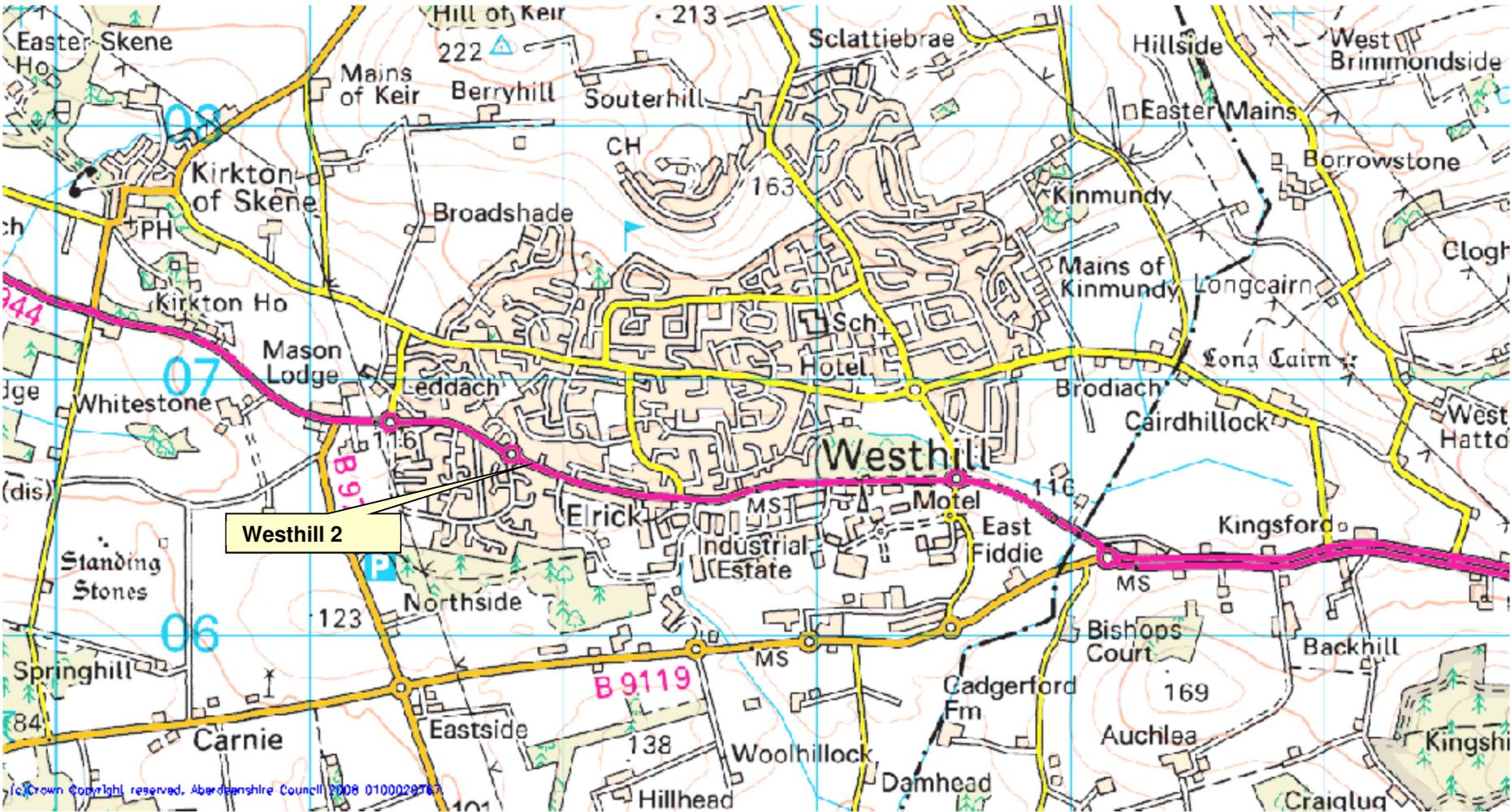


Map A.3 Location of NO₂ Diffusion Tube Sites - Peterhead

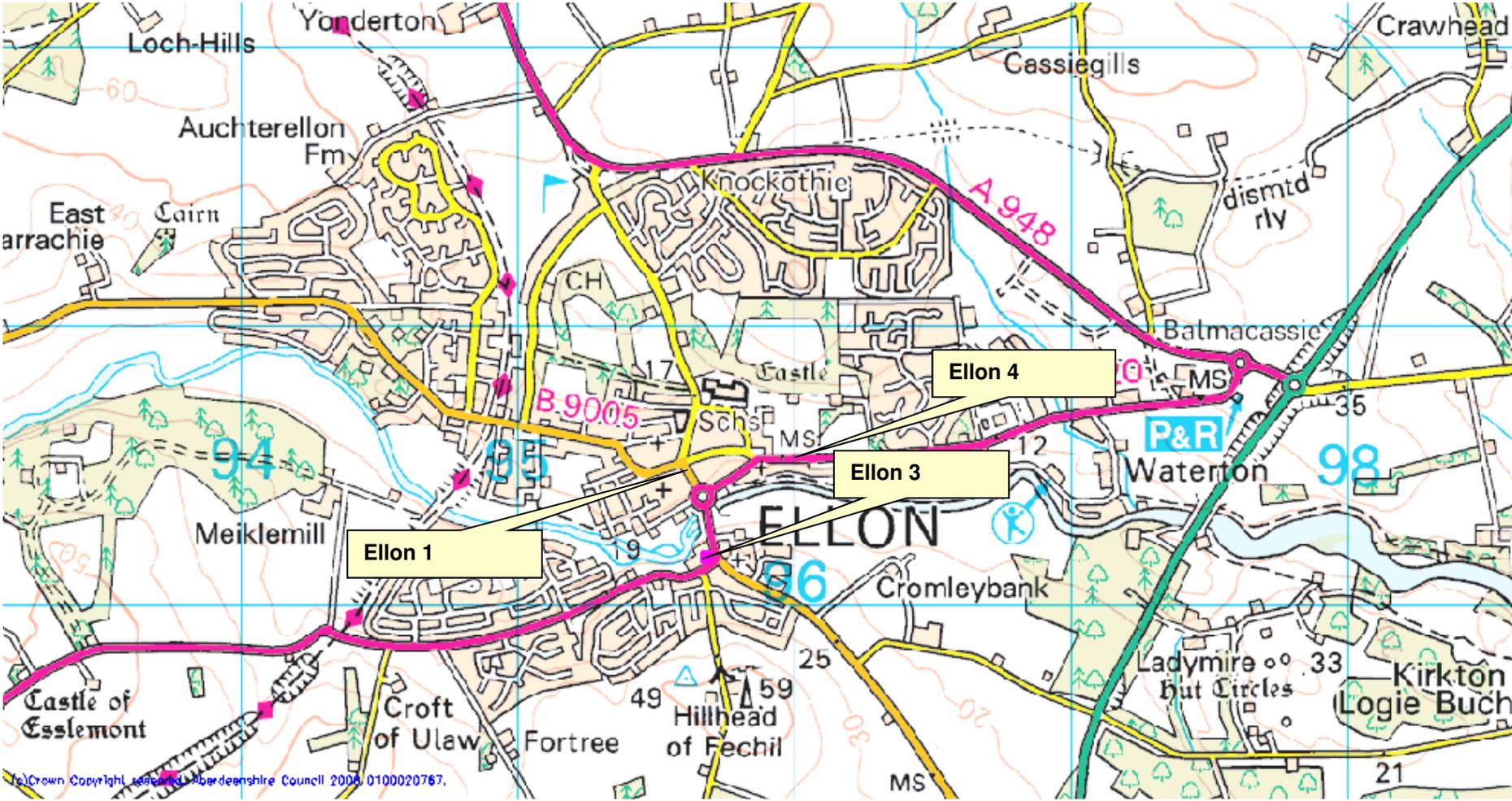


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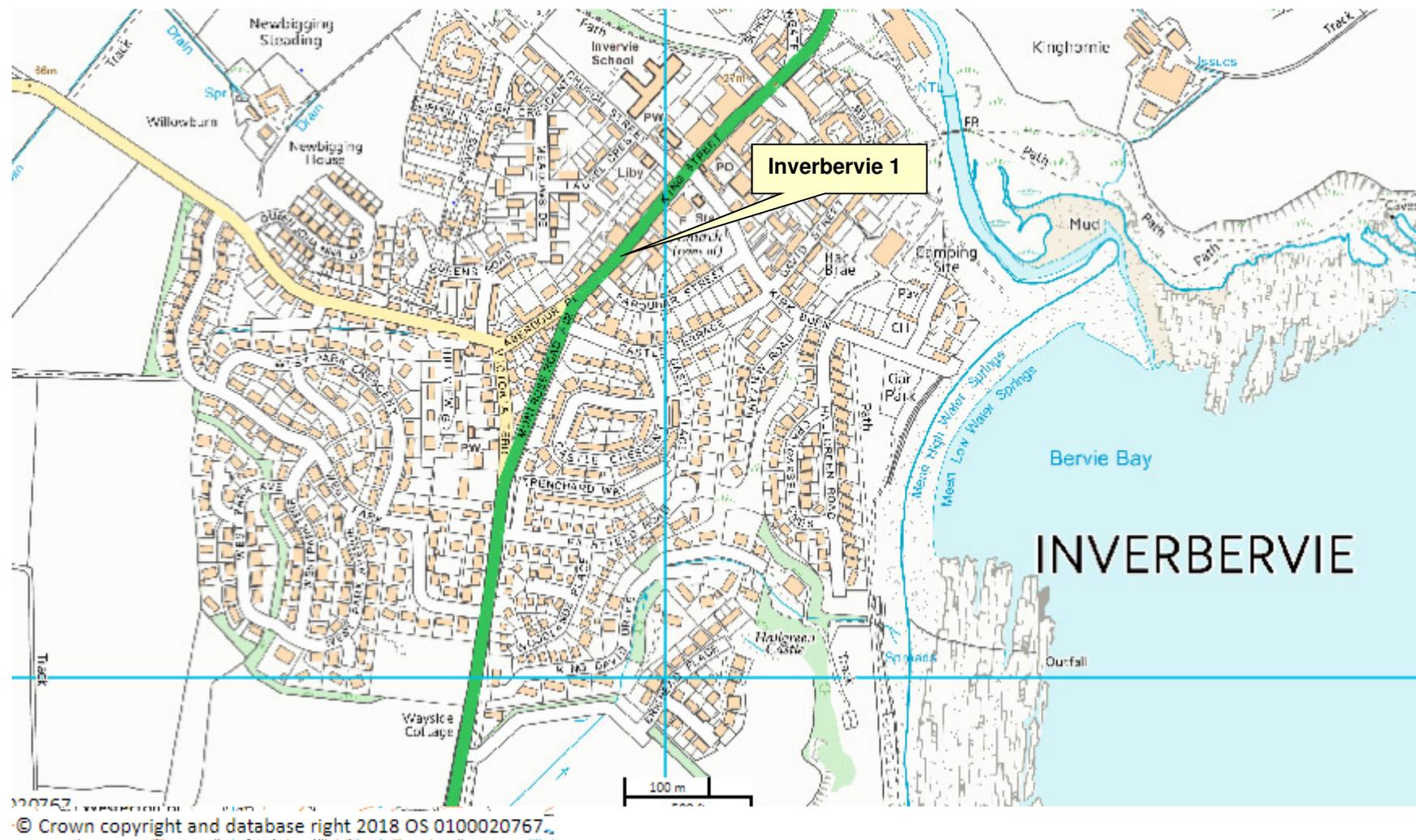
Map A.4 Location of NO₂ Diffusion Tube Site - Westhill



Map A.5 Location of NO₂ Diffusion Tube Sites - Ellon



Map A.6 Location of NO₂ Diffusion Tube Site - Inverbervie



Map A.7 Location of NO₂ Diffusion Tube Site - Oldmeldrum



Map A.8 Location of NO₂ Diffusion Tube Site - Banff



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Appendix B: Monitoring Results

Table B.1 Details of Non-Automatic Monitoring Sites

Table B.2 Annual Mean NO₂ Monitoring Results

Figure B.1 Trends at Long Term Sites (2005-17)

Figure B.2 Historical Site Data (2005-2017)

Table B.3 NO₂ Monthly Diffusion Tube Results for 2017

Table B.1 – Details of Non-Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref (Easting, Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m)	Distance to kerb of nearest road (m)	Tube collocated with a Continuous Analyser?
Inverurie 1	Roadside	E 377408 N 821583	NO ₂	No	1.8	1.5	No
Inverurie 2	Background	E 376622 N 821476	NO ₂	No	46.0	53.0	No
Inverurie MC	Roadside	E 377624 N 821295	NO ₂	No	0 ⁽¹⁾	1.5	No
Inverurie 21HS	Roadside	E 377602 N 821323	NO ₂	No	0 ⁽¹⁾	2.3	No
Westhill 2	Roadside	E 381837 N 806691	NO ₂	No	10.0	2.4	No
Ellon 1	Roadside	E 395604 N 830472	NO ₂	No	0 ⁽¹⁾	2.5	No
Ellon 3	Roadside	E 395604 N 830472	NO ₂	No	5.5	2.5	No
Ellon 4	Roadside	E 395893 N 830509	NO ₂	No	2.7	1.0	No
Oldmeldrum	Kerbside	E 380849 N 827226	NO ₂	No	2.0	0.5	No
Peterhead 2	Roadside	E 413209 N 846356	NO ₂	No	1.0	2.0	No
Peterhead 4	Roadside	E 415758 N 846144	NO ₂	No	12.0	2.0	No
Peterhead BH	Roadside	E 413379 N 845906	NO ₂	No	10.0	2.0	No
Peterhead MS1	Kerbside	E 413420 N 845918	NO ₂	No	0 ⁽¹⁾	0.8	No
Peterhead MC ⁽²⁾	Kerbside	E 412553 N 844839	NO ₂	No	1	< 3m	No
Peterhead SR ⁽²⁾	Kerbside	E 412495 N 844286	NO ₂	No	7	< 3m	No
Inverbervie 1 ⁽²⁾	Roadside	E 382957 N 772522	NO ₂	No	1	< 2m	No
Banff	Kerbside	E 368876 N 864021	NO ₂	No	0 ⁽¹⁾	1.0	No

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) Discontinued site

Table B.2 – Annual Mean NO₂ Monitoring Results

Site Name	Monitoring Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2017 (%)	NO ₂ Annual Mean Concentration (µg/m ³) ⁽¹⁾				
				2013	2014	2015	2016	2017
Inverurie 1	Diffusion Tube	92	92	33.1	34.9	31.9	31.5	27.7
Inverurie 2	Diffusion Tube	100	100	8.5	11.3	9.4	10.5	8.8
Inverurie MC	Diffusion Tube	100	100	N/A	N/A	N/A	31.0	24.3
Inverurie 21HS	Diffusion Tube	92	92	N/A	N/A	N/A	28.2	21.6
Westhill 2	Diffusion Tube	100	100	22.6	25.1	21.2	22.4	19.0
Ellon 1	Diffusion Tube	100	100	22.6	23.4	20.8 ^a	26.2	21.1
Ellon 3	Diffusion Tube	92	92	26.3	26.9	23.9 ^a	24.3 ^a	22.0
Ellon 4	Diffusion Tube	83	83	21.0	22.1	19.8 ^a	23.1	18.1 ^a
Oldmeldrum	Diffusion Tube	60	25	N/A	N/A	N/A	N/A	17.9
Peterhead 2	Diffusion Tube	83	83	27.5	30.0	28.3	23.0	19.7
Peterhead 4	Diffusion Tube	100	100	28.5 ^a	25.3	22.5	21.4	26.3
Peterhead BH	Diffusion Tube	100	100	N/A	32.2 ^a	31.4	26.6	26.4
Peterhead MS1	Diffusion Tube	100	100	N/A	28.1 ^a	28.1	25.4	25.2
Peterhead MC	Diffusion Tube	100	58	N/A	N/A	N/A	9.8	10.0 ^a
Peterhead SR	Diffusion Tube	100	58	N/A	N/A	N/A	9.7	10.0 ^a
Inverbervie 1	Diffusion Tube	100	58	N/A	N/A	N/A	20.3 ^a	16.8 ^a
Banff	Diffusion Tube	80	33	N/A	N/A	N/A	N/A	16.0 ^a

Notes: (1) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75% (marked ^a). See Appendix C for details.

Figure B.1 Trends at Long Term Sites (2005-2017)

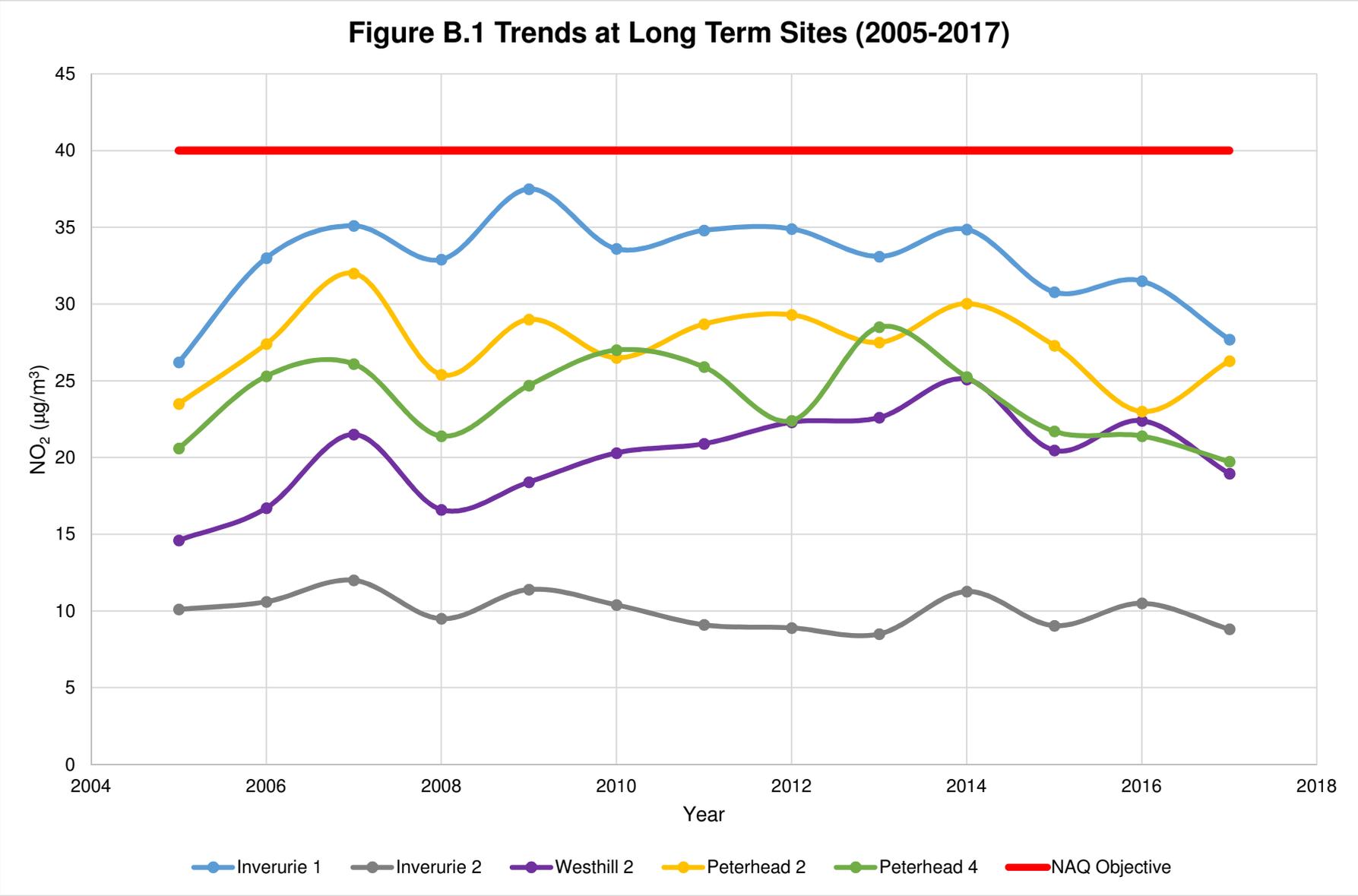


Figure B.2 Historical Site Data (2005-2017)

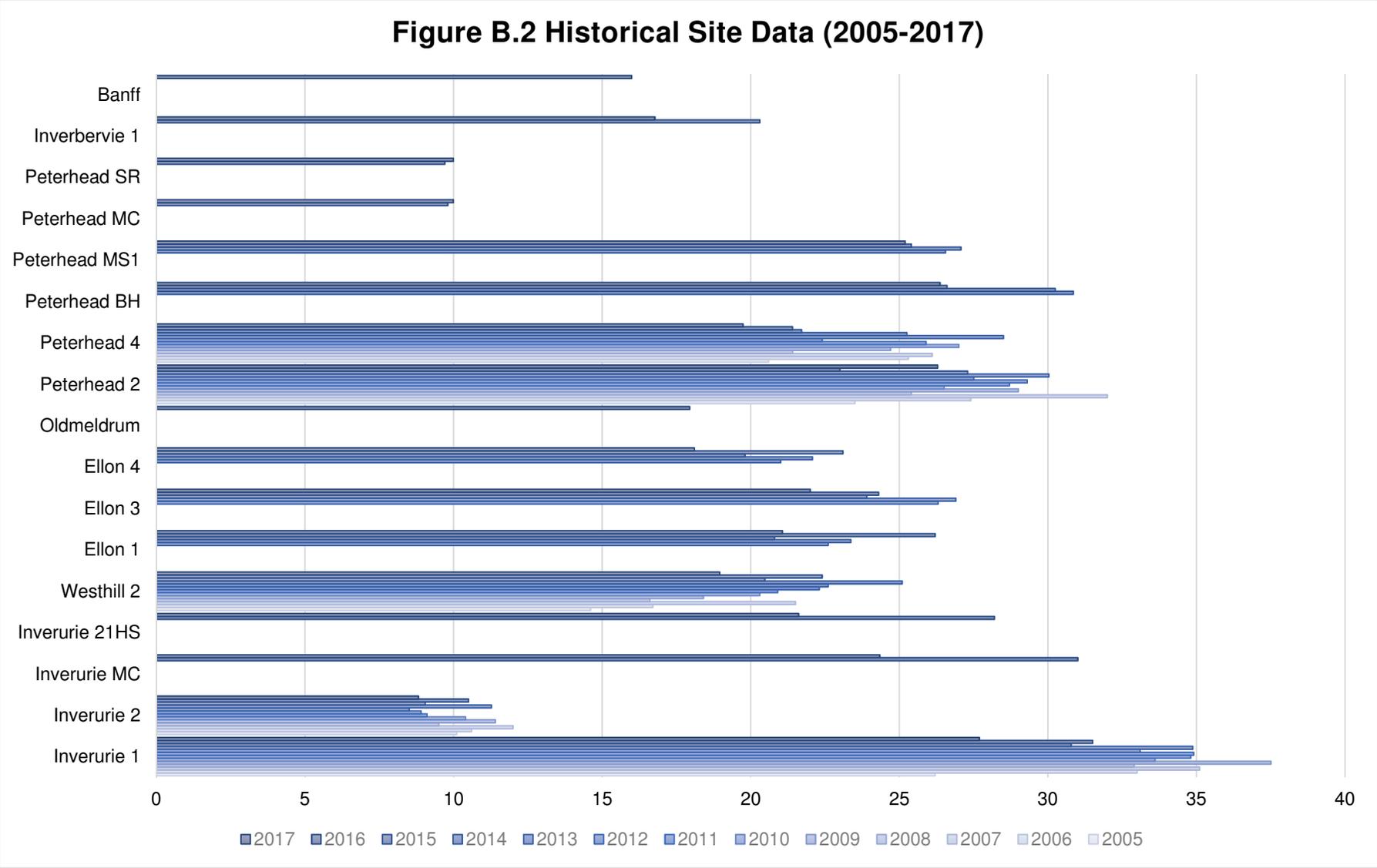


Table B.3 – NO₂ Monthly Diffusion Tube Results for 2017

Site Name	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted ⁽¹⁾	
	Inverurie 1	51	40	44	33	31	27	25	31	30	missing	44			34
Inverurie 2	23	14	13	7	8	4	6	7	8	10	15	21	11.3	8.8	
Inverurie MC	45	38	36	26	33	23	24	24	30	29	29	37	31.2	24.3	
Inverurie 21HS	43	36	31	22	27	19	20	20	32	missing	19	36	27.7	21.6	
Westhill 2	37	29	27	19	26	17	18	15	23	20	28	33	24.3	19.0	
Ellon 1	39	27	31	27	21	20	19	20	25	25	31	39	27.0	21.1	
Ellon 3	41	33	31	24	24	22	18	25	missing	28	28	36	28.2	22.0	
Ellon 4	33	28	27	20	missing	17	16	20	18	23	invalid	30	23.2	18.1	
Oldmeldrum	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	missing	missing	29	33	23.0	17.9	
Peterhead 2	invalid	51	32	23	29	32	invalid	60	28	27	25	30	33.7	26.3	
Peterhead 4	39	22	27	21	24	23	20	29	20	25	24	29	25.3	19.7	
Peterhead BH	42	34	33	26	39	44	31	37	34	34	22	30	33.8	26.4	
Peterhead MS1	39	31	35	23	36	40	36	40	36	33	24	15	32.3	25.2	
Peterhead MC	18	14	14	10	9	13	10	n/a	n/a	n/a	n/a	n/a	12.8	10.0	
Peterhead SR	21	13	12	11	10	10	11	n/a	n/a	n/a	n/a	n/a	12.8	10.0	
Inverbervie	27	23	28	20	20	15	15	n/a	n/a	n/a	n/a	n/a	21.5	16.8	
Banff	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22	20	Invalid	23	25	20.5	16.0	

(1) See Appendix C.1 for details on bias adjustment

(2) Data has been annualised. See Appendix C.2 for details of annualisation

Appendix C: Supporting Technical Information

Appendix C.1 Air Quality Monitoring Data QA/QC

Appendix C.2 Short to Long Term Data Adjustments

Appendix C.1: Air Quality Monitoring Data QA/QC

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 2017 bias adjustment factor for Aberdeen Scientific Services is **0.78**. This factor was obtained from the National Diffusion Tube Bias Adjustment Spreadsheet, version 03/18 v03_18 FINAL (available at <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>), and is based on 7 studies.

QA/QC of Diffusion Tube Monitoring

The National Diffusion Tube Bias Adjustment Spreadsheet, version 03/18 v03_18 FINAL, presents Tube Precision for Aberdeen Scientific Services as **GOOD** for 5 of the 7 studies and **POOR** for 2 studies.

Aberdeen Scientific Services (Aberdeen City Council) participates in the AIR NO₂ PT scheme, and has a **100% SATISFACTORY** score during 2017 (AR018, AR019, AR021 and AR022 inclusive) (performance statistics available at <https://laqm.defra.gov.uk/assets/AIR-PT-Rounds-13-to-24-Apr-2016-Feb-2018.pdf>).

Factor from Local Co-location Studies (if available)

Aberdeenshire Council does not undertake any co-location studies.

Appendix C.2: Short to Long Term Data Adjustments

Diffusion Tube Exposure Periods

Aberdeenshire Council follows the Defra recommended exposure calendar for NO₂ diffusion tube monitoring (available at the following link <http://laqm.defra.gov.uk/diffusion-tubes/diffusion-tubes.html>).

Short to Long Term Data Adjustments

Data capture at all long term sites was good (all sites above 75% data capture), however short to long term data adjustment is required for those sites where monitoring ceased during 2017 or those sites where monitoring began during 2017. For the 3 sites where monitoring ceased and the 2 new monitoring locations, it is necessary to annualise the data captured. This applies to the following sites:

- Peterhead MC (ceased August 2017)
- Peterhead SR (ceased August 2017)
- Inverbervie (ceased August 2017)
- Oldmeldrum (new site August 2017)
- Banff (new site August 2017)

Aberdeenshire Council does not operate, or have within the local authority boundary, any continuous monitoring sites for NO₂. Data from a continuous background site within the neighbouring local authority (Aberdeen City) has therefore been used in the calculations to annualise the data for the above listed sites. Data capture at the continuous monitoring Aberdeen City Errol Place site is above 85% for all months, except May during 2016 (data available at http://www.scottishairquality.co.uk/latest/site-info?site_id=ABD&view=statistics).

Month	Aberdeen Errol Place (monthly mean □g/m ³)	Peterhead MC (monthly measured □g/m ³)	Peterhead SR (monthly measured □g/m ³)	Inverbervie (monthly measured □g/m ³)	Oldmeldrum (monthly measured □g/m ³)	Banff (monthly measured □g/m ³)
January	19	18	21	27	n/a	n/a
February	10	14	13	23	n/a	n/a
March	8	14	12	28	n/a	n/a
April	4	10	11	20	n/a	n/a
May	4	9	10	20	n/a	n/a
June	4	13	10	15	n/a	n/a
July	4	10	11	15	n/a	n/a
August	5	n/a	n/a	n/a	21	22
September	6	n/a	n/a	n/a	Missing tube	20
October	6	n/a	n/a	n/a	Missing tube	Faulty tube
November	9	n/a	n/a	n/a	29	23
December	14	n/a	n/a	n/a	33	25
Average	7.75	12.57	12.57	21.14	27.67	22.5

The 2017 annual mean (A_m) of the Aberdeen City Errol Place site is equivalent to the calculated average of $7.75\mu\text{g}/\text{m}^3$.

The period mean ($P1_m$) of the Aberdeen City Errol Place site when the above Peterhead and Inverbervie sites have data capture is $((19+10+8+4+4+4+4)$ divided by 7) equal to $7.57\mu\text{g}/\text{m}^3$.

The period mean ($P2_m$) of the Aberdeen City Errol Place site when Oldmeldrum has data capture is $((5+9+14)$ divided by 3) equal to $9.33\mu\text{g}/\text{m}^3$.

The period mean ($P3_m$) of the Aberdeen City Errol Place site when Banff has data capture is $((5+6+9+14)$ divided by 4) equal to $8.50\mu\text{g}/\text{m}^3$.

	For Peterhead and Inverbervie sites ($P1_m$)	For Oldmeldrum site ($P2_m$)	For Banff site ($P3_m$)
Annualisation Factor Ratio of Annual Mean to Period Mean (A_m/P_m)	1.02	0.83	0.91

The annualised mean for the five sites is calculated as follows:

	Peterhead MC	Peterhead SR	Inverbervie	Oldmeldrum	Banff
Measured period mean concentration ($\mu\text{g}/\text{m}^3$)	12.6	12.6	21.1	27.7	22.5
Annualisation Factor	1.02	1.02	1.02	0.83	0.91
Annualised mean concentration ($\mu\text{g}/\text{m}^3$)	12.85	12.85	21.52	22.99	20.47
Bias Adjustment Factor	0.78	0.78	0.78	0.78	0.78
Bias Adjusted Annualised Mean Concentration ($\mu\text{g}/\text{m}^3$)	10.02	10.02	16.79	17.93	15.97

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

- 1 Aberdeenshire Council, Local Transport Strategy 2012, available at <https://www.aberdeenshire.gov.uk/media/2374/2012finalts.pdf>, January 2012
- 2 SEPA, Volcanic Ash Emissions Network (BETA), available at <http://apps.sepa.org.uk/volcanicemissionsnetwork/Dashboard.aspx?id=LochOfStrathbeg>
- 3 Aberdeenshire Council, *Air Quality Updating and Screening Assessment 2016 for Aberdeenshire Council*, available at <https://www.aberdeenshire.gov.uk/environment/environmental-protection/atmospheric-pollution/>,
- 4 Department for Environment, Food and Rural Affairs: London, *Local Air Quality Management Technical Guidance (TG16)*, April 2016