

## Annual Progress Report (APR)

**Aberdeenshire**  
COUNCIL



2020 Air Quality Annual Progress Report (APR) for  
Aberdeenshire Council

In fulfilment of Part IV of the  
Environment Act 1995

Local Air Quality Management

June 2020

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## **Executive Summary: Air Quality in Our Area**

### **Air Quality in Aberdeenshire Council**

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

## **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 continues to work with the agricultural sector, providing advice and expertise, and to identify these biomass installations ensuring the appropriate authorisations are obtained where necessary.

As a neighbouring authority to Aberdeen City Council and with the high number of commuting, leisure and other essential journeys between the two authorities, we are actively engaging through participation in meetings and open dialogue between relevant personnel to assist and enable development of a low emission zone in line with the objectives of CAFS.

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: [@EHAberdeenshire](#)

Twitter: [@AbshireEnvHlth](#)

You can also find out more about active travel, sustainable travel and advice on funding available to help you choose a low emission vehicle at <https://www.aberdeenshire.gov.uk/roads-and-travel/transportation/>

# Table of Contents

<b>Executive Summary: Air Quality in Our Area.....</b>	<b>i</b>
Air Quality in Aberdeenshire Council.....	i
Actions to Improve Air Quality.....	i
Local Priorities and Challenges.....	ii
How to Get Involved.....	ii
<b>1. Local Air Quality Management.....</b>	<b>5</b>
<b>2. Actions to Improve Air Quality.....</b>	<b>6</b>
2.1 Air Quality Management Areas.....	6
2.2 Cleaner Air for Scotland .....	6
2.2.1 Transport .....	6
2.2.2 Climate Change .....	9
2.2.3 Placemaking - Air Quality and the Local Development Plan .....	10
<b>3. Air Quality Monitoring Data and Comparison with Air Quality</b>	
<b>Objectives .....</b>	<b>11</b>
3.1 Summary of Monitoring Undertaken .....	11
3.1.1 Automatic Monitoring Sites .....	11
3.1.2 Non-Automatic Monitoring Sites.....	11
3.2 Individual pollutants.....	11
3.2.1 Nitrogen Dioxide (NO <sub>2</sub> ).....	11
3.2.2 Particulate Matter (PM <sub>10</sub> ).....	12
3.2.3 Particulate Matter (PM <sub>2.5</sub> ) .....	12
3.2.4 Sulphur Dioxide (SO <sub>2</sub> ) .....	12
3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene .....	12
<b>4. New Local Developments.....</b>	<b>13</b>
4.1 Road Traffic Sources.....	13
4.2 Other Transport Sources .....	13
4.3 Industrial Sources.....	14
4.4 Commercial and Domestic Sources .....	14
4.5 New Developments with Fugitive or Uncontrolled Sources.....	14
<b>5. Planning Applications .....</b>	<b>15</b>
<b>6. Conclusions and Proposed Actions.....</b>	<b>16</b>
6.1 Conclusions from New Monitoring Data.....	16
6.2 Conclusions relating to New Local Developments .....	16
6.3 Proposed Actions .....	17

<b>Appendix A: Monitoring Results .....</b>	<b>23</b>
<b>Appendix B: Trends and Historical Data .....</b>	<b>29</b>
<b>Appendix C: Air Quality Monitoring Data QA/QC .....</b>	<b>33</b>
<b>Glossary of Terms .....</b>	<b>38</b>
<b>References .....</b>	<b>39</b>

## 1. Local Air Quality Management

This report provides an overview of air quality in Aberdeenshire Council during 2018. 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 <sub>2</sub> )	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m <sup>3</sup>	Annual mean	31.12.2005
Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup> , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m <sup>3</sup>	Annual mean	31.12.2010
Particulate Matter (PM <sub>2.5</sub> )	10 µg/m <sup>3</sup>	Annual mean	31.12.2020
Sulphur dioxide (SO <sub>2</sub> )	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m <sup>3</sup>	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m <sup>3</sup>	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/m <sup>3</sup>	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 and the available evidence suggests that Aberdeenshire benefits from generally good air quality in terms of those emissions currently considered under the LAQM regime.

### **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 <https://www.gov.scot/Publications/2015/11/5671/17>. Progress by Aberdeenshire Council against relevant actions within this strategy is demonstrated below.

#### **2.2.1 Transport**

##### Corporate Actions

At a corporate level, Aberdeenshire Council has fully embraced the use of digital technology to improve collaborative working and reduce the need for employees to travel extensively across the council area. Adoption of Office 365 technology has reduced the need for face to face meetings and the use of modern virtual meeting spaces is encouraged where possible. The arrival of the covid-19 pandemic has meant a vast increase in the number of colleagues working from home, holding virtual meetings, etc and of course has accelerated other projects exploring the delivery of other services using online and virtual technologies.

Prior to the covid-19 pandemic, the low emission car club model for employees carrying out business mileage had been extended to locations in Peterhead, Fraserburgh, Banff/Macduff, Turriff, Strichen, Ellon and Maud.



Additionally, for council staff electric bikes are located at specific offices for free loans up to one week, to provide an opportunity to try cycling to or for work and encourage journeys to be taken in a more sustainable and healthy way. Three additional bikes are being added to this fleet in 2020 making 7 electric bikes available for staff use. Around a third of staff surveyed use the staff electric bikes in place of a private vehicle, and three quarters report that they are more likely to purchase their own bike after using the scheme.

In addition to the installation of telematics in over 800 of our fleet vehicles, Aberdeenshire Council is trialling hydrogen fuel cell cars in our corporate vehicle fleet in partnership with neighbouring local authority Aberdeen City Council.

### Education

The Transportation team education resource pack, called Embedding Active and Sustainable Travel into Education (Eastie), is still evolving in response to relevant educational topics for schools. An air quality lesson plan has been redesigned with more information suitable for rural schools with the ability for schools to carry out their own air quality study using either an air quality monitoring kit, on hire from the transportation team, or by studying different natural materials they would find in their area. An electric vehicle workshop has also been created with electric vehicle building kits with decisions based around alternative fuels. This resource pack has been presented to over 130 teaching staff at cluster meetings, induction events and in-service day training.

### Transport Strategy

In terms of wider transport strategy across the Aberdeenshire Council area, the Transport Strategy Team are currently working on various health improvement and emission reduction projects and we are also part of the Getabout partnership with Aberdeen City Council, local universities and colleges and the NHS, promoting active and sustainable travel across the Aberdeen City and Shire region (<https://www.getabout.org.uk/>).

The Transportation Strategy Development Team have been working alongside colleagues in Economic Development on a project to introduce an electric bike hire scheme at four towns along the Formartine & Buchan Way – one in Ellon, Peterhead and Fraserburgh, and two in Mintlaw. The project aims to encourage active travel and foster healthy and sustainable attitudes towards travel, and also aligns well with aspirations to grow tourism in the region. The project was due to launch in May 2020 with twenty e-bikes, but was delayed due to Covid-19.

Aberdeenshire Council is investing in promoting active travel throughout the region to deliver infrastructure improvements through its Integrated Travel Town (ITT) masterplans for Fraserburgh, Huntly, Ellon, Inverurie and Portlethen. The ITTs for each town are action plans not only for developing infrastructure improvements, but also promotional activities aimed at encouraging more active travel choices. In 2019 this masterplan project won two awards for 'Excellence in Walking, Public Realm and Cycling', at both the Scottish Transport Awards in Glasgow, and the National Transport Awards in London.



Aberdeenshire Council supports employers and employees to minimise the impact of commuting on health and the environment with a range of guidance and practical support tools; <https://www.aberdeenshire.gov.uk/roads-and-travel/transportation/commuting/>

We have also developed a Low Emission Vehicle Delivery Plan, published October 2018, to support the growth in electric vehicles within Aberdeenshire; <https://www.aberdeenshire.gov.uk/roads-and-travel/transportation/electric-vehicles/>. Integral to the plan is the expansion of the electric vehicle charging point network, which will play a pivotal role in the reduction of greenhouse gas emissions associated with the transportation sector. There are currently 49 electric vehicle charge points in Aberdeenshire, with an additional 27 in process (2020). The delivery plan supports the national approach on Low Emission Vehicles, cementing Aberdeenshire's place as a proactive authority in support of Carbon reduction, air quality improvements and technological innovation.

### **2.2.2 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 development of a NESSEAP is still an aim of Aberdeenshire Council, however this is not being prioritised for action at this time.

Aberdeenshire Council submits an annual report each year in respect of work we are doing to mitigate and reduce the impacts of climate change. The full reports can be found at <https://sustainablescotlandnetwork.org/reports/aberdeenshire-council>.

Full details of the ongoing climate change work within Aberdeenshire can be found at <https://www.aberdeenshire.gov.uk/environment/environmental-policy/>

### **2.2.3 Placemaking - Air Quality and the Local Development Plan**

Aberdeenshire Local Development Plan 2017 provides a framework for land use planning in the Aberdeenshire Council area. Policies R3 (relating to mineral workings) and P4 (relating to potentially polluting development) require that emissions to air from new development must be mitigated where there is potential for significant detrimental impacts.

The Aberdeenshire Local Development Plan 2017 is available at

<https://www.aberdeenshire.gov.uk/planning/plans-and-policies/aberdeenshire-local-development-plan-2017/>

The Proposed Aberdeenshire Local Development Plan 2021 has been published online for consultation at <https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2021/> Proposed policies P4 (Hazardous and Potentially Polluting Development), PR1.2 (Protecting Important Resources – Air Quality) and C2.1 (Renewable Energy) refer to air quality.

### **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 NO<sub>2</sub> at 11 sites during 2019. Table A.1 in Appendix A shows the 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 Appendix C.

##### **3.2.1 Nitrogen Dioxide (NO<sub>2</sub>)**

Table A.2 in Appendix A compares the adjusted monitored NO<sub>2</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>. Longer term trends of historical data are presented in Figures B.1 to B.3 in Appendix B. The full 2019 dataset of monthly mean values is provided in Table A.3 of Appendix A.

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 (PM<sub>10</sub>)**

Aberdeenshire Council does not carry out any monitoring in respect of PM<sub>10</sub> and has no current plans to do so.

### **3.2.3 Particulate Matter (PM<sub>2.5</sub>)**

Aberdeenshire Council does not carry out any monitoring in respect of PM<sub>2.5</sub> and there are no current plans to do so.

### **3.2.4 Sulphur Dioxide (SO<sub>2</sub>)**

Aberdeenshire Council does not carry out any monitoring in respect of Sulphur Dioxide and has no current plans to do so.

### **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 and has no current plans to do so.

## **4. New Local Developments**

### **4.1 Road Traffic Sources**

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)<sup>2</sup> that would trigger the current 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.

### **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. Two processes were identified in Kintore with potential for increased emissions (within the terms of their PPC Permit) and potential increased fugitive particulate emissions.

### **4.4 Commercial and Domestic Sources**

There were 60 new or proposed biomass installations and 1 CHP installation identified in 2019 through the planning system.

Where information permits, screening assessments and/or dispersion modelling has been carried out. There is ongoing work to obtain relevant information about biomass plant identified in 2018 and also in 2015, 2016 and 2017 (as listed in the annual progress reports for these years).

Work has also begun on mapping those installations that are known, across Aberdeenshire with a view to identifying the spatial distribution of these installations and thus any areas which may require additional assessment in terms of cumulative impacts.

Although there are a vast number of biomass installations throughout Aberdeenshire, these are mainly located in agricultural locations (for agricultural purposes) with very low population density.

### **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.



## **5. Planning Applications**

Planning applications relating to new biomass and CHP installations are discussed in Chapter 4.

Other than 7 applications for new or varied quarrying activities, there were no other planning applications where significant effects on air quality were identified.

## **6. Conclusions and Proposed Actions**

### **6.1 Conclusions from New Monitoring Data**

Aberdeenshire Council carried out diffusion tube monitoring at 11 sites across the local authority area. The diffusion tube monitoring data presented in Chapter 3 and Appendices A and B demonstrates that concentrations of NO<sub>2</sub> in Aberdeenshire continue to remain below the national air quality objectives; indeed, the general trend in NO<sub>2</sub> concentrations across the sites appears to be downward.

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

There are no significant changes in transport sources since the previous Annual Report in 2019.

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 have been identified. Additional information is required to complete screening assessments for some of these new biomass installations. Work is ongoing to map the location of all known biomass plant in Aberdeenshire such that cumulative impacts can be better considered.

### 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 NO<sub>2</sub> at all diffusion tube sites are below the national objective, examination of long term diffusion tube data suggests that monitoring should continue at the 3 sites in Inverurie and Westhill 2. Due to changes in traffic flow around Aberdeenshire following the opening of the AWPR, traffic flow at the junction covered by the Ellon 3 diffusion tube changed with vehicle queuing now more prevalent from the south. Consequently, it was decided to change this monitoring location nearer to the south of this road junction.

Monitoring sites at Peterhead 2, Peterhead 4 and in Oldmeldrum were discontinued at the end of 2019 as we moved our focus to areas where local intelligence suggested it would be useful to obtain data, with 2 new locations in Inverurie, 1 new location in Westhill and 1 new location in Fraserburgh. These will be reported in detail in the next annual progress report in 2021, however at the time of writing, it is expected that concentrations of nitrogen dioxide across all sites will be heavily impacted by the lockdown measures of the covid-19 pandemic.

All diffusion tube monitoring sites will be reviewed again in 2021, once 2020 bias adjusted results are available.

### Commercial and Domestic Sources

Information will be sought in respect of biomass installations where sufficient information has not yet been provided. Screening assessments will be completed in due course following receipt of the required information.

Work on mapping all known biomass installations in Aberdeenshire will continue.

An update on biomass installations in Aberdeenshire will be provided in the next Annual Report in 2021.

Concluding Action

Aberdeenshire Council intends to submit an Annual Progress Report in 2021.

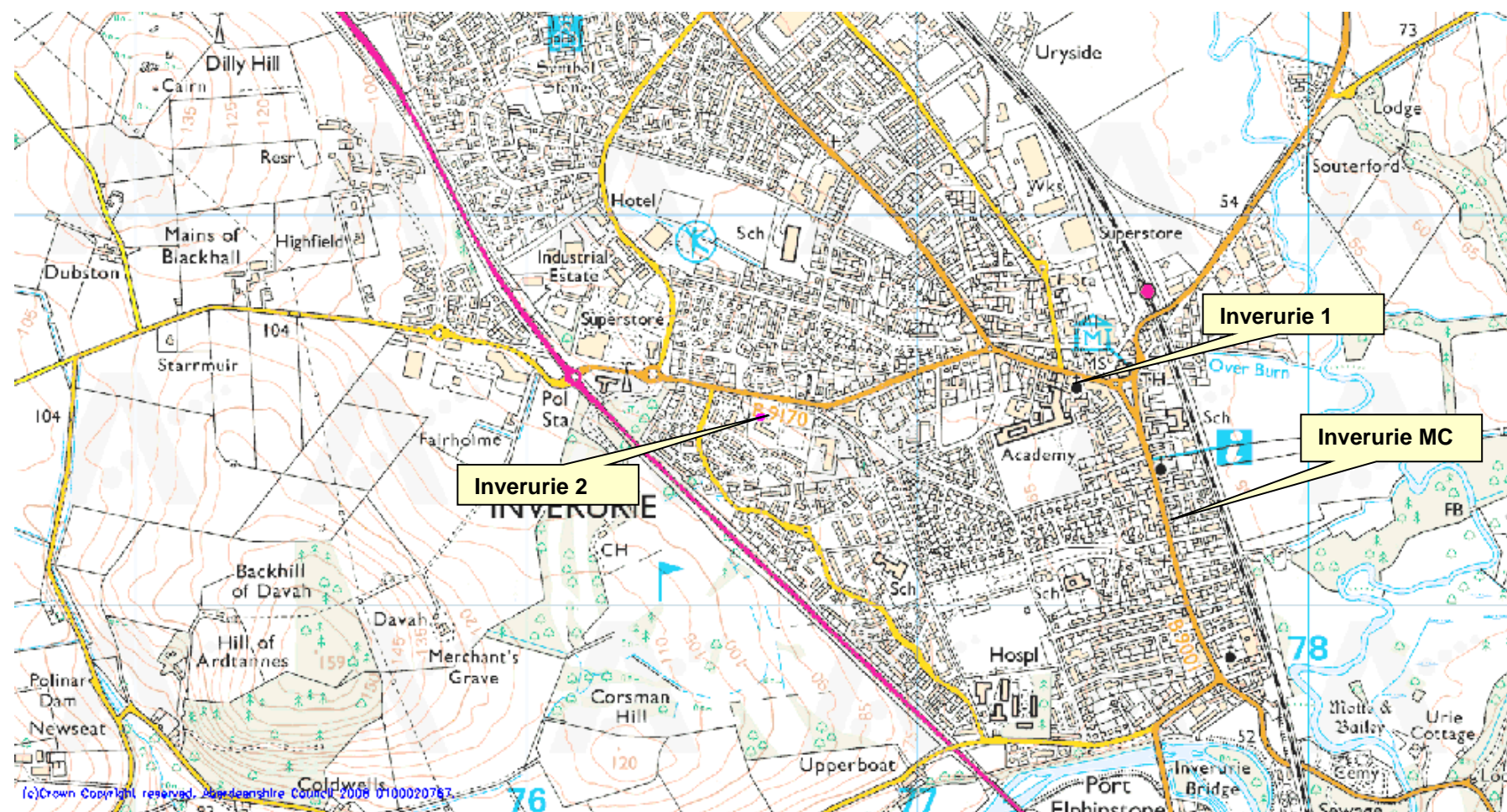
## **Appendix A: Non-Automatic Monitoring Sites**

<b>Map A.1</b>	<b>Settlements in Aberdeenshire where NO<sub>2</sub> Diffusion Tube Monitoring was undertaken during 2019</b>
<b>Map A.2</b>	<b>Location of NO<sub>2</sub> Diffusion Tube Sites (Inverurie)</b>
<b>Map A.3</b>	<b>Location of NO<sub>2</sub> Diffusion Tube Sites (Peterhead)</b>
<b>Map A.4</b>	<b>Location of NO<sub>2</sub> Diffusion Tube Sites (Westhill)</b>
<b>Map A.5</b>	<b>Location of NO<sub>2</sub> Diffusion Tube Sites (Ellon)</b>
<b>Map A.6</b>	<b>Location of NO<sub>2</sub> Diffusion Tube Site (Oldmeldrum)</b>
<b>Map A.7</b>	<b>Location of NO<sub>2</sub> Diffusion Tube Site (Banff)</b>
<b>Table A.1</b>	<b>Details of Non-Automatic Monitoring Sites</b>
<b>Table A.2</b>	<b>Annual Mean NO<sub>2</sub> Monitoring Results</b>
<b>Table A.3</b>	<b>NO<sub>2</sub> Monthly Diffusion Tube Results for 2019</b>

**Map A.1      Settlements in Aberdeenshire where NO<sub>2</sub> Diffusion Tube Monitoring was undertaken during 2019**



Map A.2 Location of NO<sub>2</sub> Diffusion Tube Sites - Inverurie



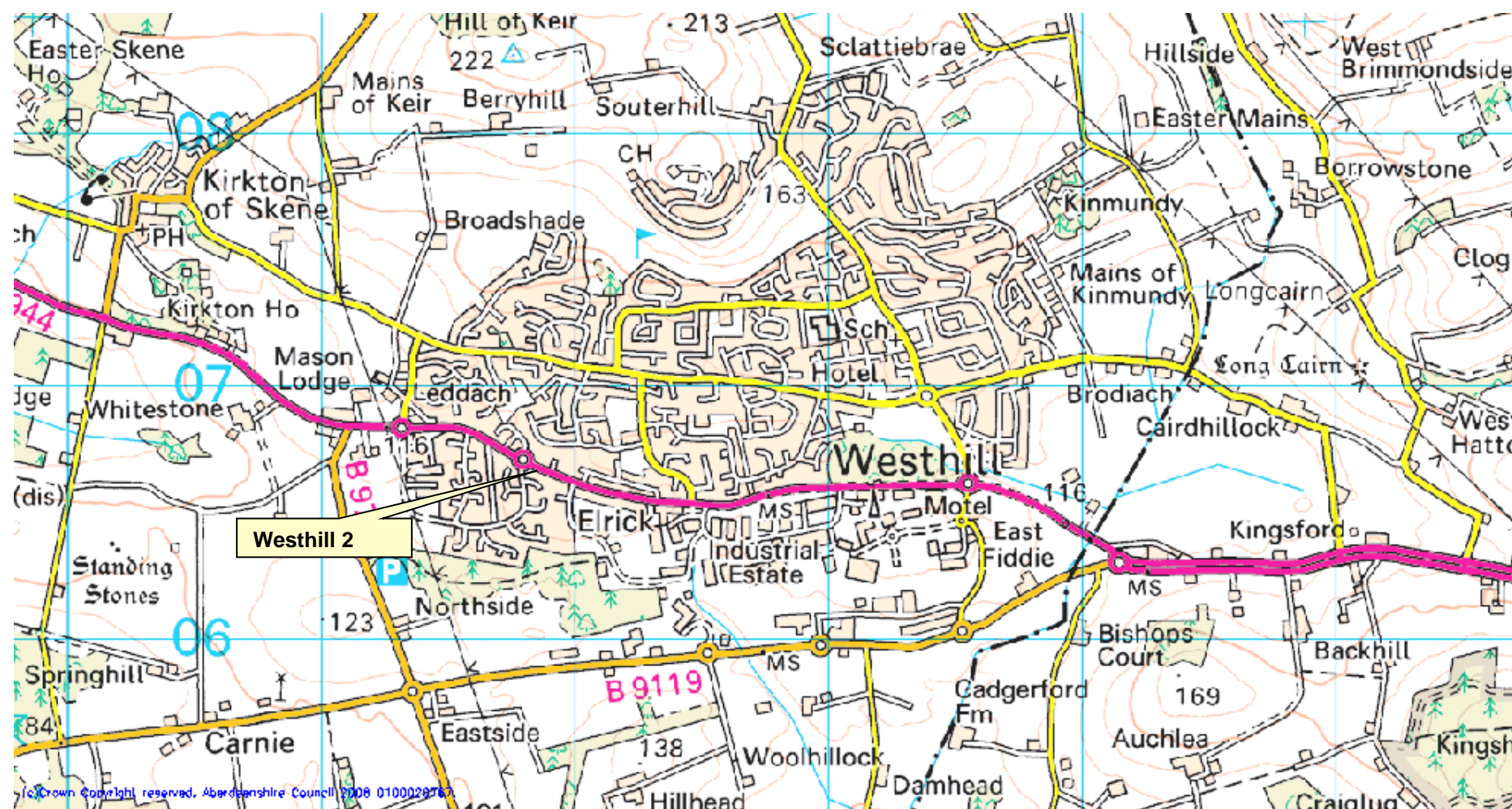


### Map A.3 Location of NO<sub>2</sub> Diffusion Tube Sites - Peterhead

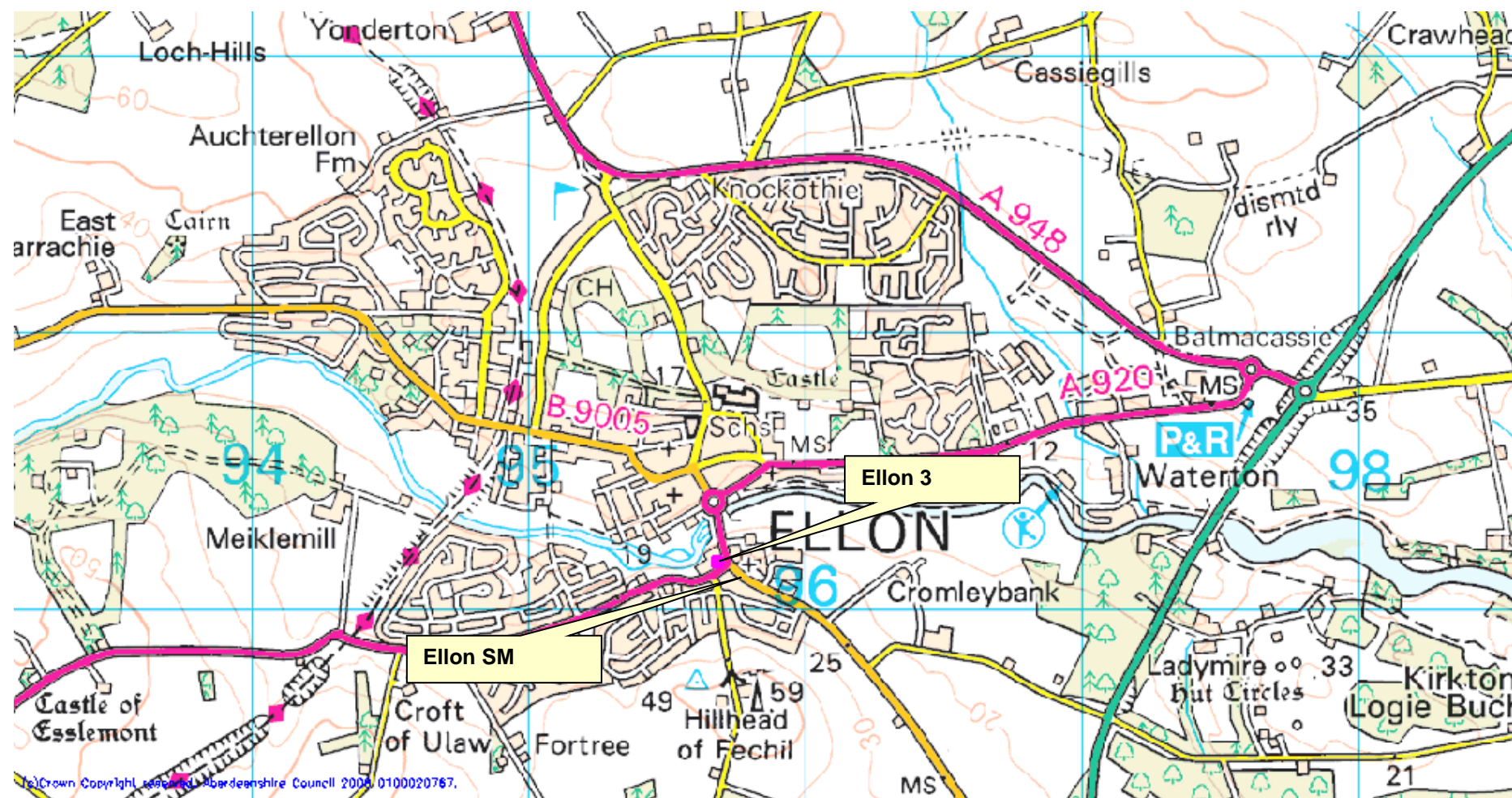




Map A.4 Location of NO<sub>2</sub> Diffusion Tube Site - Westhill

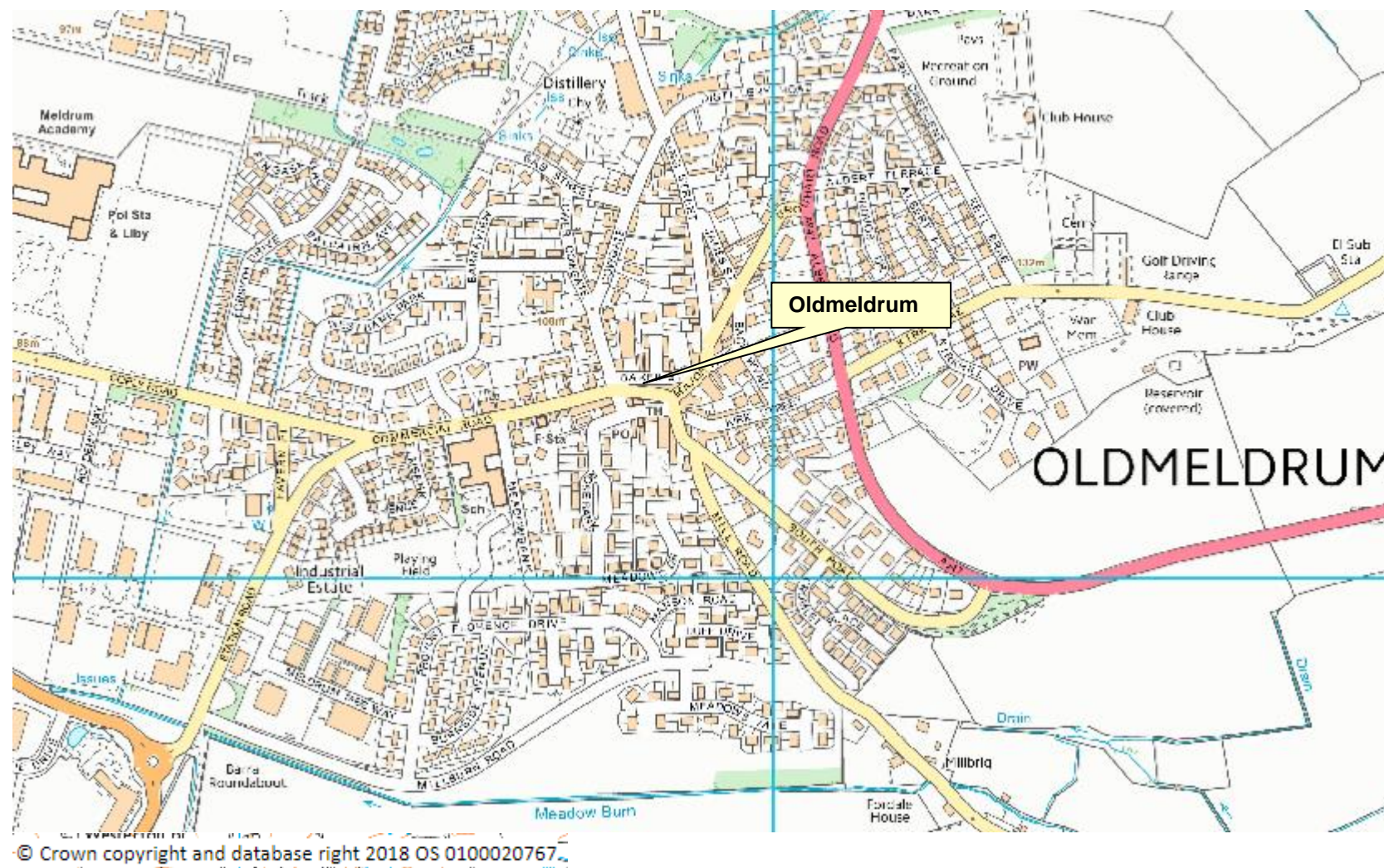


Map A.5 Location of NO<sub>2</sub> Diffusion Tube Sites - Ellon





**Map A.6      Location of NO<sub>2</sub> Diffusion Tube Site - Oldmeldrum**



## Appendix A: Monitoring Results

**Table A.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 <sub>2</sub>	No	1.8	1.5	No
Inverurie 2	Background	E 376622 N 821476	NO <sub>2</sub>	No	46.0	53.0	No
Inverurie MC	Roadside	E 377624 N 821295	NO <sub>2</sub>	No	0 <sup>(1)</sup>	1.5	No
Westhill 2	Roadside	E 381837 N 806691	NO <sub>2</sub>	No	10.0	2.4	No
Ellon 3	Roadside	E 395713 N 830172	NO <sub>2</sub>	No	5.5	2.5	No
Ellon SM	Roadside	E 395750 N 830115	NO <sub>2</sub>	No	4.7	0.5	No
Oldmeldrum	Kerbside	E 380849 N 827226	NO <sub>2</sub>	No	2.0	0.5	No
Peterhead 2	Roadside	E 413209 N 846356	NO <sub>2</sub>	No	1.0	2.0	No
Peterhead 4	Roadside	E 412758 N 846144	NO <sub>2</sub>	No	12.0	2.0	No
Peterhead BH	Roadside	E 413379 N 845906	NO <sub>2</sub>	No	10.0	2.0	No
Peterhead MS1	Kerbside	E 413420 N 845918	NO <sub>2</sub>	No	0 <sup>(1)</sup>	0.8	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).

Table A.2 – Annual Mean NO<sub>2</sub> Monitoring Results

Site Name	Monitoring Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2019 (%)	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(1)</sup>				
				2015	2016	2017	2018	2019
Inverurie 1	Diffusion Tube	100	100	31.9	31.5	27.7	26.4	25.9
Inverurie 2	Diffusion Tube	100	100	9.4	10.5	8.8	10.3	8.9
Inverurie MC	Diffusion Tube	100	100	N/A	31.0	24.3	24.0	24.2
Westhill 2	Diffusion Tube	100	100	21.2	22.4	19.0	18.8	17.8
Ellon 3	Diffusion Tube	100	58	23.9	24.3	22.0	21.2	21.5 <sup>(3)</sup>
Ellon SM	Diffusion Tube	100	42	N/A	N/A	N/A	N/A	18.1 <sup>(3)</sup>
Oldmeldrum	Diffusion Tube	100	100	N/A	N/A	17.9	19.4	17.1
Peterhead 2	Diffusion Tube	100	100	28.3	23.0	19.7	22.0	18.8
Peterhead 4	Diffusion Tube	100	100	22.5	21.4	26.3	21.6	19.9
Peterhead BH	Diffusion Tube	100	100	31.4	26.6	26.4	24.0	19.7
Peterhead MS1	Diffusion Tube	100	100	28.1	25.4	25.2	24.8	17.3

Notes: Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) 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%. See Appendix C for details

**Table A.3 – NO<sub>2</sub> Monthly Diffusion Tube Results for 2019**

Site Name	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted <sup>(1)</sup>
Inverurie 1	47	41	34	27	24	23	23	26	24	31	49	34	32	26
Inverurie 2	23	15	8	9	8	6	6	6	8	10	18	15	11	9
Inverurie MC	39	37	28	36	29	25	23	19	19	27	46	31	30	24
Westhill 2	36	25	18	30	21	18	17	13	16	19	28	23	22	18
Ellon 3	38 <sup>(4)</sup>	32 <sup>(4)</sup>	24 <sup>(4)</sup>	28 <sup>(4)</sup>	21 <sup>(4)</sup>	22 <sup>(4)</sup>	20 <sup>(4)</sup>	-	-	-	-	-	26	21
Ellon SM	-	-	-	-	-	-	-	27 <sup>(4)</sup>	17 <sup>(4)</sup>	22 <sup>(4)</sup>	23 <sup>(4)</sup>	26 <sup>(4)</sup>	23	18
Oldmeldrum	38	22	18	21	20	18	15	14	16	20	31	21	21	17
Peterhead 2	28 <sup>(2)</sup>	27 <sup>(2)</sup>	22	29	22	18	22 <sup>(3)</sup>		17	23	24	23	23	19
Peterhead 4	25 <sup>(2)</sup>	34 <sup>(2)</sup>	23	30	23	18	20 <sup>(3)</sup>		18	24	27	28	25	20
Peterhead BH	27 <sup>(2)</sup>	30 <sup>(2)</sup>	22	29	21	19	23 <sup>(3)</sup>		19	28	19	31	24	20
Peterhead MS1	25 <sup>(2)</sup>	27 <sup>(2)</sup>	22	28	17	13	19 <sup>(3)</sup>		16	26	14	28	21	17

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

(2)&(3) Exposure different to recommended Diffusion Tube Calendar duration. See Appendix C.1 for discussion.

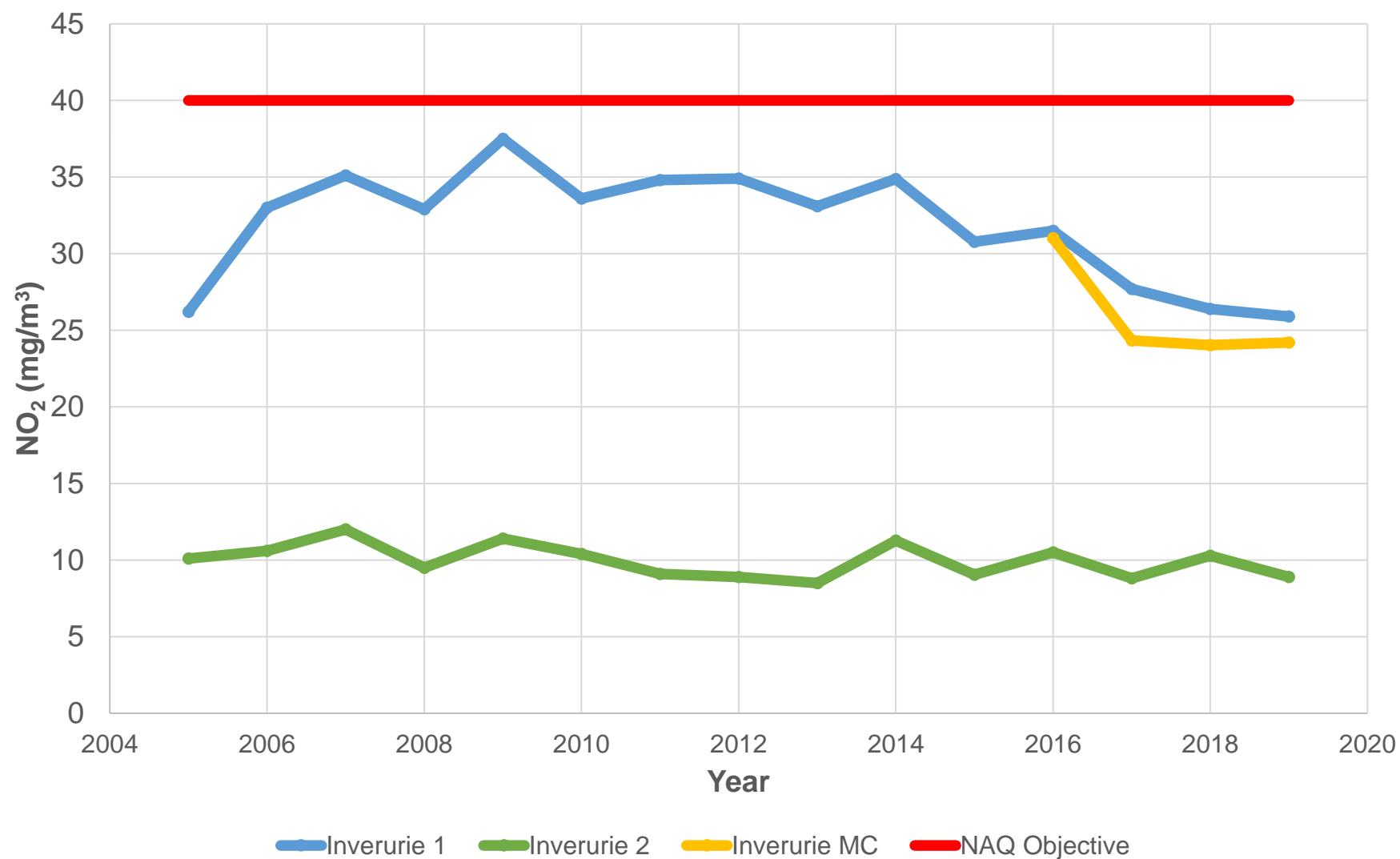
(4) Diffusion tube moved to alternative lamppost at same junction, near regularly queuing traffic as a result of local intelligence, this data has been annualised (See Appendix C)

## **Appendix B: Trends and Historical Data**

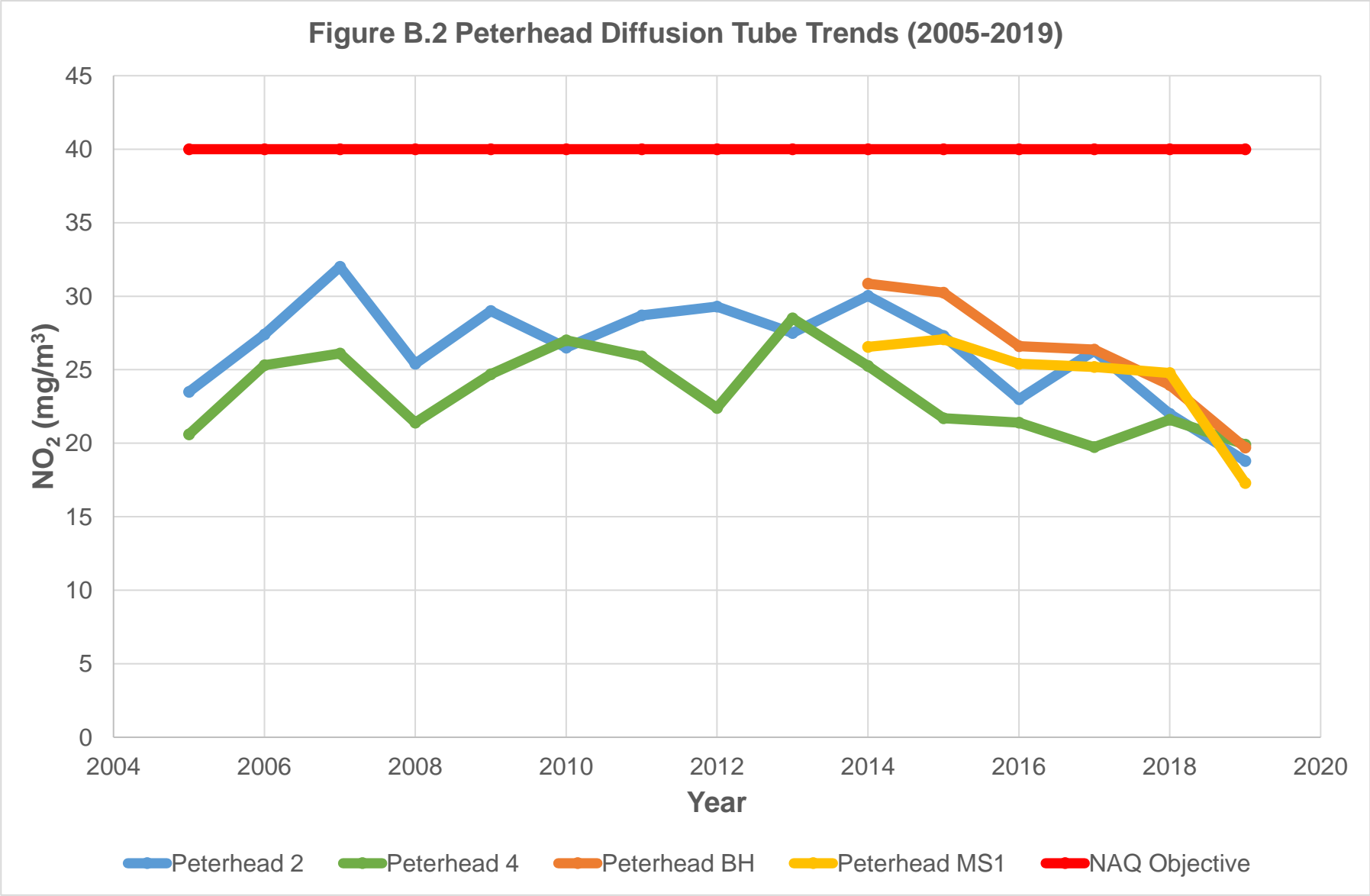
**Figure B.1 Inverurie Diffusion Tube Trends (2005-19)**

**Figure B.2 Peterhead Diffusion Tube Trends (2005-19)**

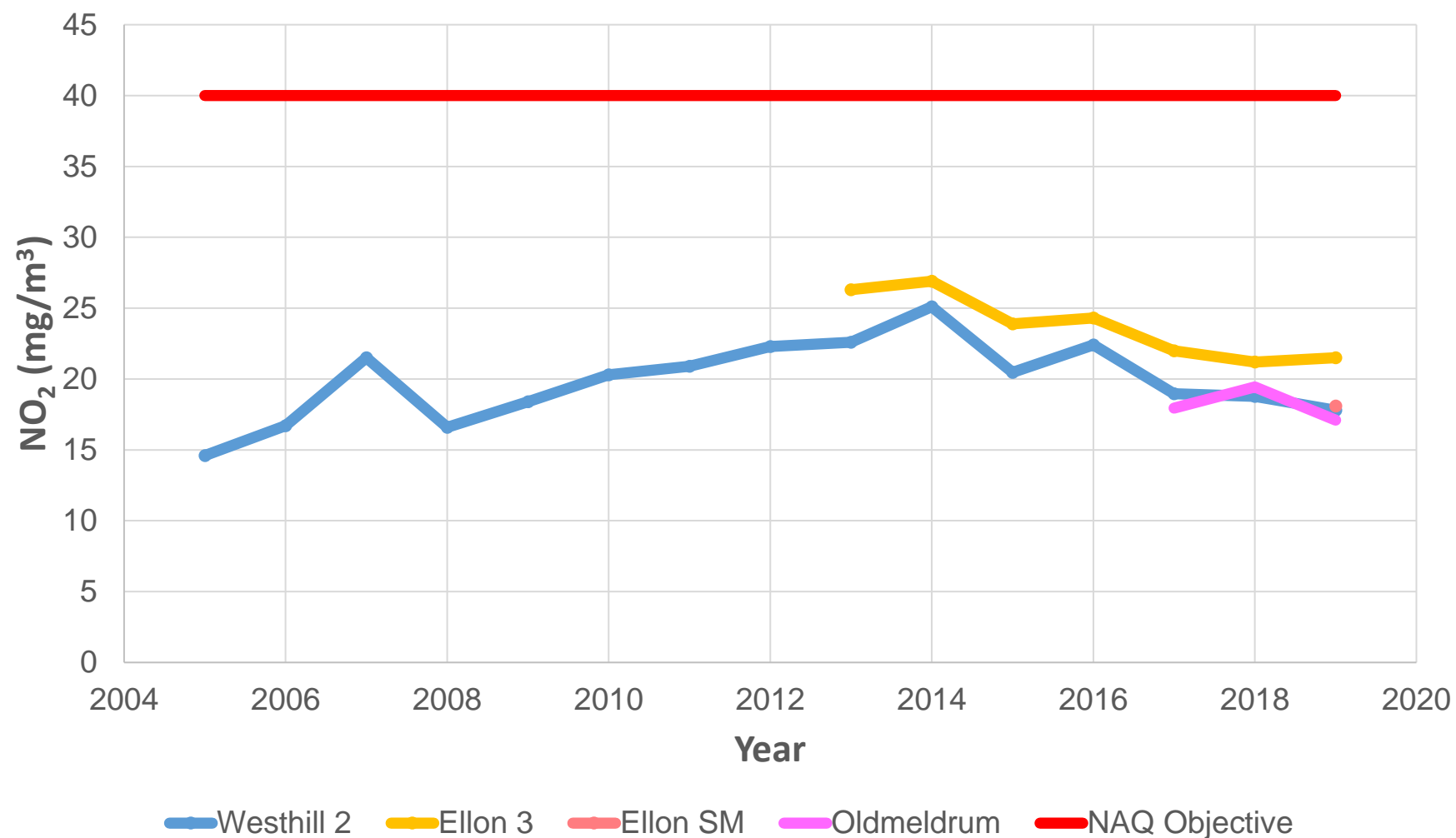
**Figure B.3 Other Towns Diffusion Tube Trends (2005-19)**

**Figure B.1 Inverurie Diffusion Tube Trends (2005-2019)**





**Figure B.3**      **Other Towns Diffusion Tube Trends (2005-2019)**



## Appendix C: 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 2019 bias adjustment factor for Aberdeen Scientific Services is **0.81**. This factor was obtained from the National Diffusion Tube Bias Adjustment Spreadsheet, version 03/20 (available at <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>), and is based on 6 studies.

### QA/QC of Diffusion Tube Monitoring

The National Diffusion Tube Bias Adjustment Spreadsheet, version 03/20 presents Tube Precision for Aberdeen Scientific Services as **GOOD** for all 6 studies.

Aberdeen Scientific Services (Aberdeen City Council) participates in the AIR NO<sub>2</sub> PT scheme, and has a 75% SATISFACTORY score for January-February 2019 (AR030) and a **100% SATISFACTORY** score during the remainder of 2019 (AR031, AR033 and AR034 inclusive) (performance statistics available at <https://laqm.defra.gov.uk/assets/laqmno2performancedatauptonovember2019v1.pdf>).

### Factor from Local Co-location Studies (if available)

Aberdeenshire Council does not undertake any co-location studies.

### Diffusion Tube Exposure Periods

Aberdeenshire Council follows the Defra recommended exposure calendar for NO<sub>2</sub> diffusion tube monitoring (available at the following link <http://laqm.defra.gov.uk/diffusion-tubes/diffusion-tubes.html>).

### **Departure from Diffusion Tube Calendar Exposure Periods**

Period 2 diffusion tubes at Peterhead sites were changed one week late due to human error (ie, 5 week exposure). In order to get back in sequence with the national exposure calendar, period 3 diffusion tubes at Peterhead sites were therefore changed after a 3 week exposure rather than a 4 week exposure. These results are marked (2) in Table A.3 of Appendix A.

Period 7 diffusion tubes at Peterhead sites were not changed after their scheduled 5 week exposure, and were exposed for the entirety of period 8 in addition to period 7 due to human error (ie, two periods exposure). To compensate the measured mean has been calculated by dividing the sum by 11 (rather than 12) to ensure worst case data is used. These results are marked (3) in Table A.3 of Appendix A.

As both sets of diffusion tube results were generally as would otherwise be expected it was decided these results could be included in the annual mean calculations.

The procedure for changing diffusion tubes in Peterhead has now been changed with a view to minimising these errors.

### **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 Ellon, where the location of the diffusion tube was changed part way through the year due as local intelligence suggested queuing traffic at an alternative location within the same road transport junction. For the previous and new monitoring locations, it is necessary to annualise the data captured. This applies to the following sites:

- Ellon 3 (ceased end period 7 2019)
- Ellon SM (began period 8 2019)

Aberdeenshire Council does not operate, or have within the local authority boundary, any continuous monitoring sites for NO<sub>2</sub>. 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 October during 2019 (data available at [http://www.scottishairquality.co.uk/latest/site-info?site\\_id=ABD&view=statistics](http://www.scottishairquality.co.uk/latest/site-info?site_id=ABD&view=statistics)).

Month	Aberdeen Errol Place (monthly mean $\mu\text{g}/\text{m}^3$ )	Ellon 3 (monthly measured $\mu\text{g}/\text{m}^3$ )	Ellon SM (monthly measured $\mu\text{g}/\text{m}^3$ )
January	28	38	n/a
February	26	32	n/a
March	14	24	n/a
April	14	28	n/a
May	11	21	n/a
June	10	22	n/a
July	12	20	n/a
August	13	n/a	27
September	14	n/a	17
October	18	n/a	22
November	19	n/a	23
December	22	n/a	26
Average	16.75	26.43	23

The 2019 annual mean ( $A_m$ ) of the Aberdeen City Errol Place site is equivalent to the calculated average of  $16.75\mu\text{g}/\text{m}^3$ .

The period mean ( $P1_m$ ) of the Aberdeen City Errol Place site when Ellon 3 has data capture is  $((28+26+14+14+11+10+12)$  divided by 7) equal to  $16.43\mu\text{g}/\text{m}^3$ .

The period mean ( $P2_m$ ) of the Aberdeen City Errol Place site when Ellon SM has data capture is  $((13+14+18+19+22)$  divided by 5) equal to  $17.2\mu\text{g}/\text{m}^3$ .

	For Ellon 3 (P1 <sub>m</sub> )	For Ellon SM (P2 <sub>m</sub> )
<b>Annualisation Factor</b>		
Ratio of Annual Mean to Period Mean ( $A_m/P_m$ )	<b>1.02</b>	<b>0.97</b>

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

	Ellon 3	Ellon SM
Measured period mean concentration ( $\mu\text{g}/\text{m}^3$ )	26	23
Annualisation Factor	1.02	0.97
Annualised mean concentration ( $\mu\text{g}/\text{m}^3$ )	26.52	22.31
Bias Adjustment Factor	0.81	0.81
<b>Bias Adjusted Annualised Mean Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>21.48</b>	<b>18.07</b>

## 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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide



## References

- 1     Aberdeenshire Council, *Air Quality Updating and Screening Assessment 2018 for Aberdeenshire Council*, available at <https://www.aberdeenshire.gov.uk/environment/environmental-protection/atmospheric-pollution/>,
- 2     Department for Environment, Food and Rural Affairs: London, *Local Air Quality Management Technical Guidance (TG16)*, April 2016