



# 2020 Air Quality Annual Progress Report (APR) for **ARGYLL AND BUTE COUNCIL**

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2020

Argyll and Bute Council

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

### **Air Quality in Argyll and Bute**

Air quality in Argyll and Bute is considered to be generally very good and complies with all the air quality objectives listed in Table 1.1. The Council has not identified any areas where air quality objectives may be under threat and where specific action is required to improve air quality. There is therefore no requirement to undertake a Detailed Assessment for any pollutant.

Argyll and Bute is an authority with over 73% of its area classified as remote<sup>1</sup> and a population which is widely distributed. There is only one town with a population greater than 10,000 and industries tend to be geographically diverse and related to the natural assets of the area. Forestry and agriculture are prevalent inland, whilst in coastal areas there are a number of distilleries, aquaculture and fishing businesses. Large scale industry is absent and this is reflected by the low number and nature of industries regulated by SEPA under the Pollution Prevention and Control regime. Tourism makes a significant and important contribution to the Argyll and Bute economy and is responsible for higher summer-time traffic flows in some areas.

Results of modelling of sources of nitrogen dioxide and fine particulates are presented in Figures 9, 10 and 11 and show that background concentrations are very low. In the absence of industry hotspots the major potential source of pollution that may impact on human health is the motor vehicle. However, traffic flows tend to reflect the low dispersed population but a network of nitrogen dioxide diffusion tubes is maintained to monitor those areas in town centres considered to be subject to higher concentrations. Reference to the measured annual trends in Figures 1 to 4 shows that nitrogen dioxide levels are well below the annual objective and trends are either level or falling at all sites.

The shift to install small to medium-sized biomass boilers at commercial premises has continued. Technical details supporting planning applications are subject to scrutiny and evaluation in accordance with guidance to ensure that air quality objectives should not be compromised.

### **Actions to Improve Air Quality**

Where opportunities exist the Council supports initiatives such as the multi-agency Argyll Timber Transport Forum which aims to minimise the environmental impact of

timber transport between forest and mill. This is achieved through the use of dedicated off-highway transport routes and sea transport via the TimberLink network. The TimberLINK service ships up to 100,000 tonnes of timber a year from the Argyll ports of Ardrishaig, Campbeltown, Sandbank and temporary facilities to wood processing plants in Ayrshire removing around 8,000 lorry journeys (or nearly one million lorry miles) a year from roads between Argyll and Ayrshire, including tourist routes in Argyll and the Greater Glasgow conurbation.

The Council works in Partnership with Transport Scotland, Highlands and Islands Transport Partnership (HITRANS) and Strathclyde Partnership for Transport (SPT) to secure funding to install electric vehicle charging infrastructure across the region and to improving accessibility to public transport services with the aim of reducing the dependence on vehicles powered by fossil fuels.

### **Local Priorities and Challenges**

Although the Council does not face any specific challenges in relation to air quality the current regulatory system does not fully control the potential emissions from smaller biomass boilers and stoves which often fall out with the development planning system. It is understood that this issue is being considered as part of an ongoing review of the Clean Air Act.

### **How to Get Involved**

The Council publishes a report summarising the results of its air quality monitoring. Copies can be downloaded at <https://www.argyll-bute.gov.uk/planning-and-environment/air-pollution-and-local-air-quality>.

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## 1. Local Air Quality Management

This report provides an overview of air quality in Argyll and Bute Council during 2019. 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 Argyll and Bute 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.

**Argyll and Bute Council currently does not have any AQMAs and this current and past annual assessments suggest that it will be very unlikely to be necessary to declare any AQMAs in the future based on current air quality objectives.**

### **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 Argyll and Bute Council against relevant actions within this strategy is demonstrated below.

#### **2.2.1 Transport – Avoiding travel – T1**

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. Argyll and Bute Council does not currently have a formal corporate travel plan but the widely dispersed geographical location of offices and other workplaces (including islands) has prompted the widespread development of facilities such as video conferencing with a consequent reduction in travel. Upgrading and increased use of ICT has allowed a number of employees to work from home. The possibility that a further continued increase in home-working following its widespread use as part of Covid-19 measures has been recognised and will allow staff to continue to reduce business travel between locations within the working day.

All of Argyll and Bute's schools have a travel plan in place. School Travel Plans identify issues relating to the school journey and set out agreed aims and packages

of measures to promote more sustainable travel choices for pupils, parents, staff and visitors.

The Council are committed to trying to encourage modal shift from the private car to more sustainable, low emission modes of transport however, this can be challenging in rural areas where public transport connectivity is often infrequent or non-existent. Despite this the Council work with a number of key stakeholders annually to secure funding for active, public transport and behaviour change projects. These include infrastructure interventions such as cycle paths, cycle parking etc. and projects aimed at encouraging behaviour change such as travel plans, signage and mapping.

### **2.2.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2**

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. With the exception of the urban cores of Helensburgh, Dunoon and Rothesay, Argyll and Bute is not connected to the national gas grid whilst local LPG networks of limited extent and capacity exist in Campbeltown and Oban. There has been a programme of the installation of biomass boilers at schools and other Council buildings to replace other heating fuels, generally oil or electricity. Argyll and Bute Council does not have a formally adopted sustainable action energy plan but other strategies include provisions with the potential to exploit synergies between climate change and air quality.

Local Development Policy LDP 6 Supporting the Sustainable Growth of Renewables<sup>2</sup> requires that the Council will support renewable energy developments where these are consistent with the principles of sustainable development and it can be adequately demonstrated that there would be no unacceptable significant adverse effects, whether individual or cumulative, including on local communities. This policy includes air quality and installations are assessed as part of planning application and Clean Air Act requirements.

The Council's Economic Development Strategy<sup>3</sup> has identified a role to encourage the creation of business clusters to concentrate employment opportunities with a reduction in the demand for commuting. The Strategy also supports the continued development of the established renewables sector including wind, solar and hydro. This contributes to the reduction in air quality and climate change impact outwith

Argyll and Bute due to the reduction in the dependence of the electricity generating industry on the burning of fossil fuels such as coal and gas.

The Council works in partnership with Strathclyde Partnership for Transport to secure funding for public transport infrastructure projects in Helensburgh and Lomond.

These generally focus on improving accessibility to public transport services and upgrades to shelters and public transport information. The Council are committed to encouraging increased use of low emission vehicles and have been working in partnership with Highlands and Islands Transport Partnership (HITRANS) to secure annual funding from Transport Scotland to install charging infrastructure across the region. Figure 5 shows the extent of the current network of charging points for electric vehicles.

### **2.3 National Low Emission Framework (NLEF) Stage 1 Screening Appraisal for Argyll and Bute Council**

Argyll and Bute Council currently does not have any AQMAs, and therefore a Stage 1 Screening Appraisal has not been undertaken.

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

#### **3.1 Summary of Monitoring Undertaken**

##### **3.1.1 Automatic Monitoring Sites**

Argyll and Bute Council did not undertake any automatic (continuous) monitoring during 2019 as previous report identified that this was unnecessary

##### **3.1.2 Non-Automatic Monitoring Sites**

Argyll and Bute Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 10 sites during 2019. Table A.1 in Appendix A shows the details of the sites.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Maps showing the location of the monitoring sites are provided in Appendix D.

#### **3.2 Individual pollutants**

Argyll and Bute Council's monitoring programme reflects the previous outcomes of assessment reports which identified nitrogen dioxide as a pollutant to monitor. 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 ratified and 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>.

For diffusion tubes, the full 2019 dataset of monthly mean values is provided in Appendix B.

The results show that for all sites the bias adjusted annual mean concentrations of NO<sub>2</sub> continue to be well below the annual objective. The majority of sites have been monitored continuously for between 10 and 15 years allowing trends to be plotted and it can be seen from Figures 1 to 4 that the annual average trend is downwards at all urban sites.

**3.2.2 Particulate Matter (PM<sub>10</sub>)**

**3.2.3 Argyll and Bute Council does not monitor PM<sub>10</sub>.Particulate Matter (PM<sub>2.5</sub>)**

Argyll and Bute Council does not monitor PM<sub>2.5</sub>.

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

Argyll and Bute Council does not monitor SO<sub>2</sub>.

**3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene**

Argyll and Bute Council does not monitor carbon monoxide, lead or 1,3 butadiene.

## 4. New Local Developments

Since the publication of the 2019 Annual Progress Report<sup>4</sup> there have been a small number of new developments which, if approved, may affect air quality as characterised by guidance LAQM TG16<sup>5</sup>. They are listed in the sections below:

### 4.1 Road Traffic Sources

Argyll and Bute Council confirms that there are no roads or features in the following list that are new or newly identified that would require further assessment:

- 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

Argyll and Bute Council confirms that there none of the following that are new or newly identified that would warrant further 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

Argyll and Bute Council confirms that there none of the following that are new or newly identified that would warrant further assessment:

- Industrial installations: new or proposed installations for which an air quality assessment has been carried out. See Section 5.
- Industrial installations: existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- Industrial installations: new or significantly changed installations with no previous air quality assessment.

- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

#### 4.4 Commercial and Domestic Sources

The biomass boilers listed in Table 4.1 were the subject of an assessment at the planning stage to determine the potential impact on sensitive receptors. The planning applications were approved.

**Table 4.1 Proposed Biomass Boilers >50kW**

| Site                        | Rating kW | Stack Height m | Building Height m | Effective Stack Height m | Stack Diameter m |
|-----------------------------|-----------|----------------|-------------------|--------------------------|------------------|
| Darlochan Yard, Campbeltown | 325       | 6.0            | 3.0               | 5.0                      | 0.2              |
| MRC, Barcaldine             | 600       | 14.5           | 13.0              | 2.5                      | 0.25             |
| Knockdow Estate, Toward     | 770       | 8.35           | 4.45              | 6.5                      | 0.8              |
| Loch Melfort Hotel          | 150       | 8.1            | 6.7               | 2.4                      | 0.25             |

The boilers listed in table 4.1 were assessed in accordance with the guidance contained in Box 5.8 LAQM.TG(09)<sup>6</sup>. Emission rates were estimated based on the maximum thermal capacity of the boiler and the emission factors provided for PM<sub>10</sub> and NO<sub>2</sub>. Background concentrations for 2019 were obtained from the Scottish Air Quality Archive<sup>7</sup>. A summary of the results from the sites are presented in Tables 4.2, 4.3 and 4.4. It should be noted that the PM<sub>10</sub> screening assessments have been made against the more stringent annual mean objective.

**Table 4.2. Biomass boilers – assessment against annual mean PM<sub>10</sub> objective**

| Site                        | Adjusted emission rate g/s | Threshold emission rate g/s | Progress to detailed assessment? |
|-----------------------------|----------------------------|-----------------------------|----------------------------------|
| Darlochan Yard, Campbeltown | 0.0011                     | 0.0052                      | No                               |
| MRC, Barcaldine             | 0.0008                     | 0.0030                      | No                               |
| Knockdow Estate, Toward     | 0.0019                     | 0.0101                      | No                               |
| Loch Melfort Hotel          | 0.0001                     | 0.0028                      | No                               |

**Table 4.3. Biomass boilers – assessment against annual mean NO<sub>2</sub> objective**

| Site                        | Adjusted emission rate g/s | Threshold emission rate g/s | Progress to detailed assessment? |
|-----------------------------|----------------------------|-----------------------------|----------------------------------|
| Darlochan Yard, Campbeltown | 0.0008                     | 0.0052                      | No                               |
| MRC, Barcaldine             | 0.0011                     | 0.0030                      | No                               |
| Knockdow Estate, Toward     | 0.0030                     | 0.0101                      | No                               |
| Loch Melfort Hotel          | 0.0003                     | 0.0028                      | No                               |

**Table 4.4. Biomass boilers – assessment against 24 hour NO<sub>2</sub> objective**

| Site                        | Adjusted emission rate g/s | Threshold emission rate g/s | Progress to detailed assessment? |
|-----------------------------|----------------------------|-----------------------------|----------------------------------|
| Darlochan Yard, Campbeltown | 0.0060                     | 0.0436                      | No                               |
| MRC, Barcaldine             | 0.0086                     | 0.0273                      | No                               |
| Knockdow Estate, Toward     | 0.0236                     | 0.1079                      | No                               |
| Loch Melfort Hotel          | 0.0022                     | 0.0259                      | No                               |

Using the guidance provided in LAQM.TG16<sup>5</sup> it has been concluded that there are no areas considered to be at risk of objectives being exceeded due to cumulative impacts of multiple biomass/domestic combustion installations.

#### **4.5 New Developments with Fugitive or Uncontrolled Sources**

There are a number of new un-metalled access roads associated with forestry extraction or windfarm construction that are of a temporary nature and are hard surfaced with graded and rolled aggregate. These roads are of a standard suitable for road-going vehicles and are invariably remote, inherently damp and do not threaten to cause breaches of PM<sub>10</sub> or PM<sub>2.5</sub> objectives. **The Council does not propose to carry out individual assessments of these sources unless particular circumstances indicate that it would be appropriate.**

## 5. Planning Applications

The following planning applications with a potential air quality impact and subject to an air quality assessment were submitted in 2019:

Port Ellen Distillery, Islay – 19/00917/PP

The approved application was for the reopening of the closed Port Ellen Distillery and construction of a new visitor centre. The project would also include the installation of a new 5.6MW oil-fired boiler to serve the distillery and the adjacent maltings. An air quality assessment was undertaken and concluded that air quality objectives would not be exceeded. The boiler plant will be operated under the Medium Combustion Plant Directive.

Bunnahabhain Distillery, Islay – 19/02552/PP

The approved application was for the replacement of the existing oil-fired boiler and construction of a new visitor centre. The project would also include the installation of a new 6MW biomass boiler capable of burning draff which is a waste material from the production process. An air quality assessment was undertaken and concluded that air quality objectives would not be exceeded. The boiler plant will be operated under the Medium Combustion Plant Directive.

Elixir Distillery, Islay – 19/02555/PP

A planning application for a new distillery at Port Ellen, Islay is currently under consideration. The development includes a twin 3.75MW oil-fired boiler installation which will render it liable for regulation under the Medium Combustion Plant Directive. Should the application be approved, further details will be provided in the 2021 Annual Progress Report.

Details of planning applications within the Council's planning area can be found [online](#)<sup>8</sup>. Planning applications made within the area of Loch Lomond and Trossachs National Park Authority can also be accessed [online](#)<sup>9</sup>.

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

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

The graphs in Figures 1 to 4 continue to show a long-term steady or falling trend in those areas monitored by nitrogen dioxide diffusion tubes and all sites are well below the annual mean objective. There is therefore no requirement to undertake a Detailed Assessment.

### **6.2 Conclusions relating to New Local Developments**

Local developments warranting consideration for air quality impacts have included the installation of biomass boilers at a four sites in rural areas and large capacity boilers associated with distilleries. The developments were screened for potential adverse air quality impact and it was concluded that air quality objectives would not be threatened and further assessments were not required.

### **6.3 Proposed Actions**

Argyll and Bute Council has reviewed the siting of diffusion tubes in its nitrogen dioxide monitoring network and determined that monitoring will be continued at all 10 existing sites. Exceedances or likely exceedances of objectives for any pollutant have not been identified. Results of monitoring and other air quality assessment work will be presented in the next Annual Progress Report due in June 2021.

## Appendix A: Monitoring Results

**Table A.1 – Details of Non-Automatic Monitoring Sites**

| Site ID | Site Name                    | Site Type        | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube collocated with a Continuous Analyser? |
|---------|------------------------------|------------------|---------------|---------------|----------------------|----------|--|---|---|
| N1      | George Street 1, Oban        | Roadside         | 185921        | 729942        | NO <sub>2</sub>      | N        | 5  | 2   | No  |
| N2      | George Street 2, Oban        | Roadside         | 185880        | 730253        | NO <sub>2</sub>      | N        | 0  | 5   | No  |
| N3      | George Street 3, Oban        | Roadside         | 185870        | 730317        | NO <sub>2</sub>      | N        | 0  | 5   | No  |
| N4      | Argyll Street, Dunoon        | Roadside         | 217324        | 676894        | NO <sub>2</sub>      | N        | 6  | 3   | No  |
| N5      | Main St, Campbeltown         | Roadside         | 171970        | 620380        | NO <sub>2</sub>      | N        | 0  | 3   | No  |
| N6      | Colchester Sq, Lochgilphead  | Roadside         | 186280        | 687920        | NO <sub>2</sub>      | N        | 0  | 2   | No  |
| N7      | Inverneil                    | Rural Background | 184019        | 681303        | NO <sub>2</sub>      | N        | 3  | N/A   | No  |
| N8      | East Princes St, Helensburgh | Roadside         | 229919        | 682287        | NO <sub>2</sub>      | N        | 4  | 2   | No  |

Argyll and Bute Council

| Site ID | Site Name                   | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Distance to Relevant Exposure (m) <sup>(1)</sup> | Distance to kerb of nearest road (m) <sup>(2)</sup> | Tube collocated with a Continuous Analyser? |
|---------|-----------------------------|-----------|---------------|---------------|----------------------|----------|--|---|---|
| N9      | Main Road, Cardross         | Roadside  | 234338        | 677717        | NO <sub>2</sub>      | N        | 6  | 2   | No  |
| N10     | Sinclair Street Helensburgh | Roadside  | 229675        | 682442        | NO <sub>2</sub>      | N        | 0  | 3   | 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) N/A if not applicable.

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

| Site ID | Site Type      | Monitoring Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2019 (%) <sup>(2)</sup> | NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup> |      |      |      |      |
|---------|----------------|-----------------|---|--|---|------|------|------|------|
|         |                |                 |   |  | 2015  | 2016 | 2017 | 2018 | 2019 |
| N1      | Roadside       | Diffusion Tube  | 100   | 100  | 20.8  | 18.5 | 21.1 | 20.1 | 21.4 |
| N2      | Roadside       | Diffusion Tube  | 100   | 92   | 23.0  | 22.2 | 22.5 | 22.2 | 20.1 |
| N3      | Roadside       | Diffusion Tube  | 100   | 100  | 23.3  | 21.3 | 22.5 | 20.8 | 21.9 |
| N4      | Roadside       | Diffusion Tube  | 100   | 100  | 12.5  | 12.4 | 12.1 | 12.1 | 13.5 |
| N5      | Roadside       | Diffusion Tube  | 100   | 92   | 16.0  | 15.8 | 15.4 | 15.8 | 15.6 |
| N6      | Roadside       | Diffusion Tube  | 100   | 100  | 18.1  | 15.1 | 17.8 | 13.5 | 14.8 |
| N7      | Rural B'ground | Diffusion Tube  | 100   | 92   | 1.9   | 2.1  | 2.1  | 2.1  | 2.2  |
| N8      | Roadside       | Diffusion Tube  | 100   | 92   | 10.9  | 10.2 | 10.8 | 9.9  | 11.8 |
| N9      | Roadside       | Diffusion Tube  | 100   | 100  | 11.1  | 10.3 | 10.7 | 11.2 | 13.0 |
| N10     | Roadside       | Diffusion Tube  | 100   | 100  | 16.9  | 16.2 | 17.1 | 15.0 | 15.5 |

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.

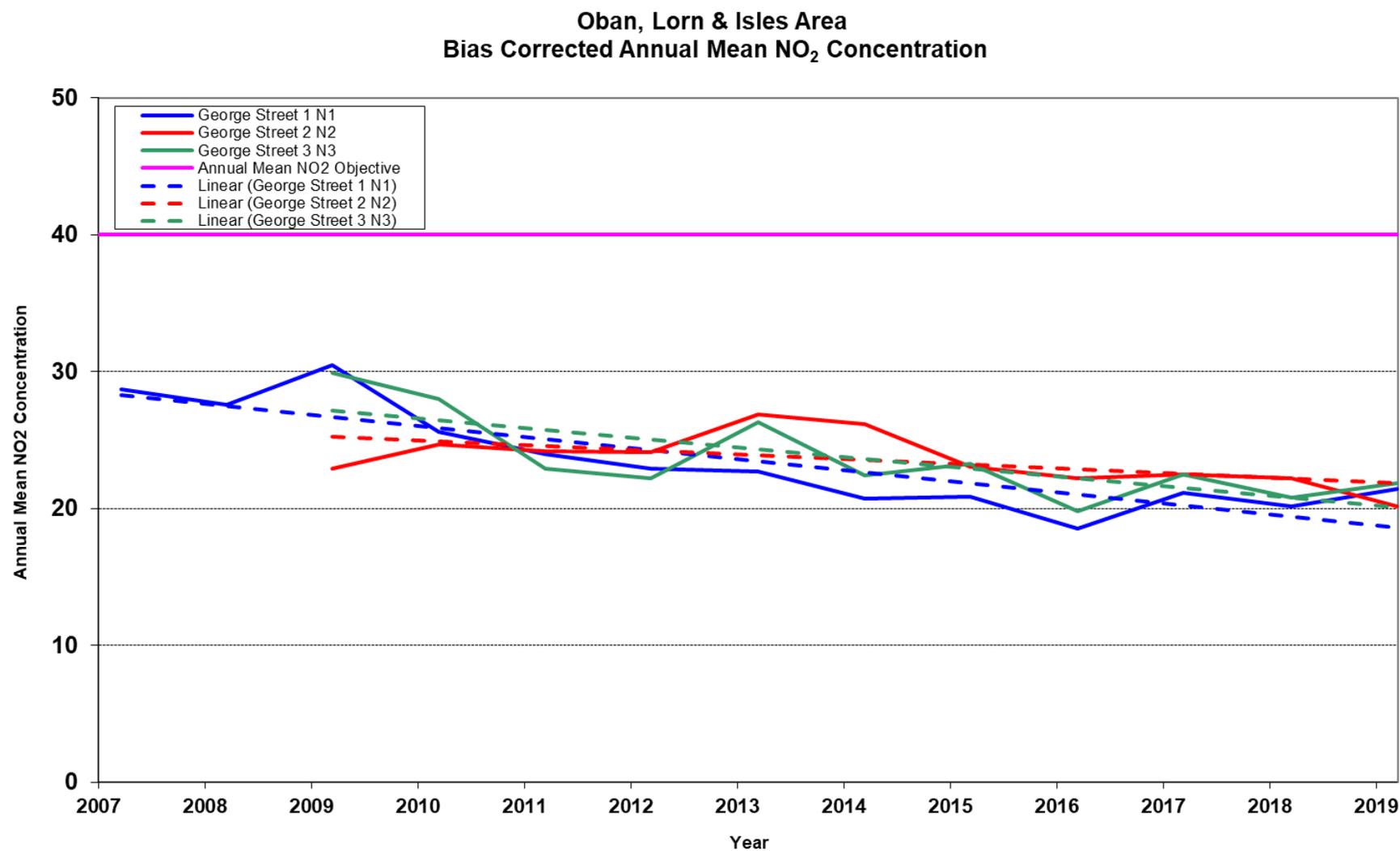
Figure 1. Graph of Annual NO<sub>2</sub> trends – Oban, Lorn and Isles Area

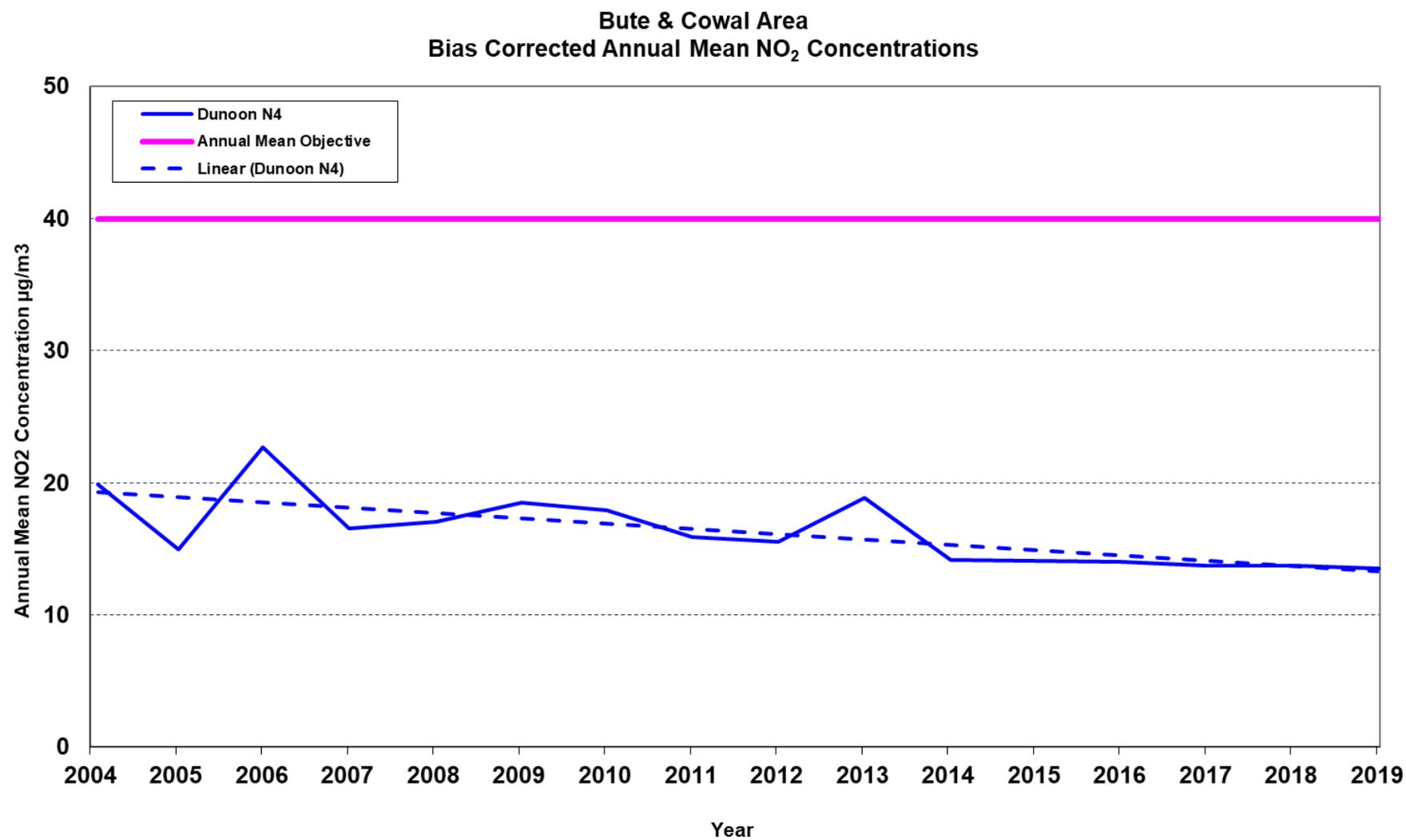
Figure 2. Graph of Annual NO<sub>2</sub> trends – Bute and Cowal area

Figure 3. Graph of Annual NO<sub>2</sub> trends – Mid-Argyll, Kintyre and Islay Area

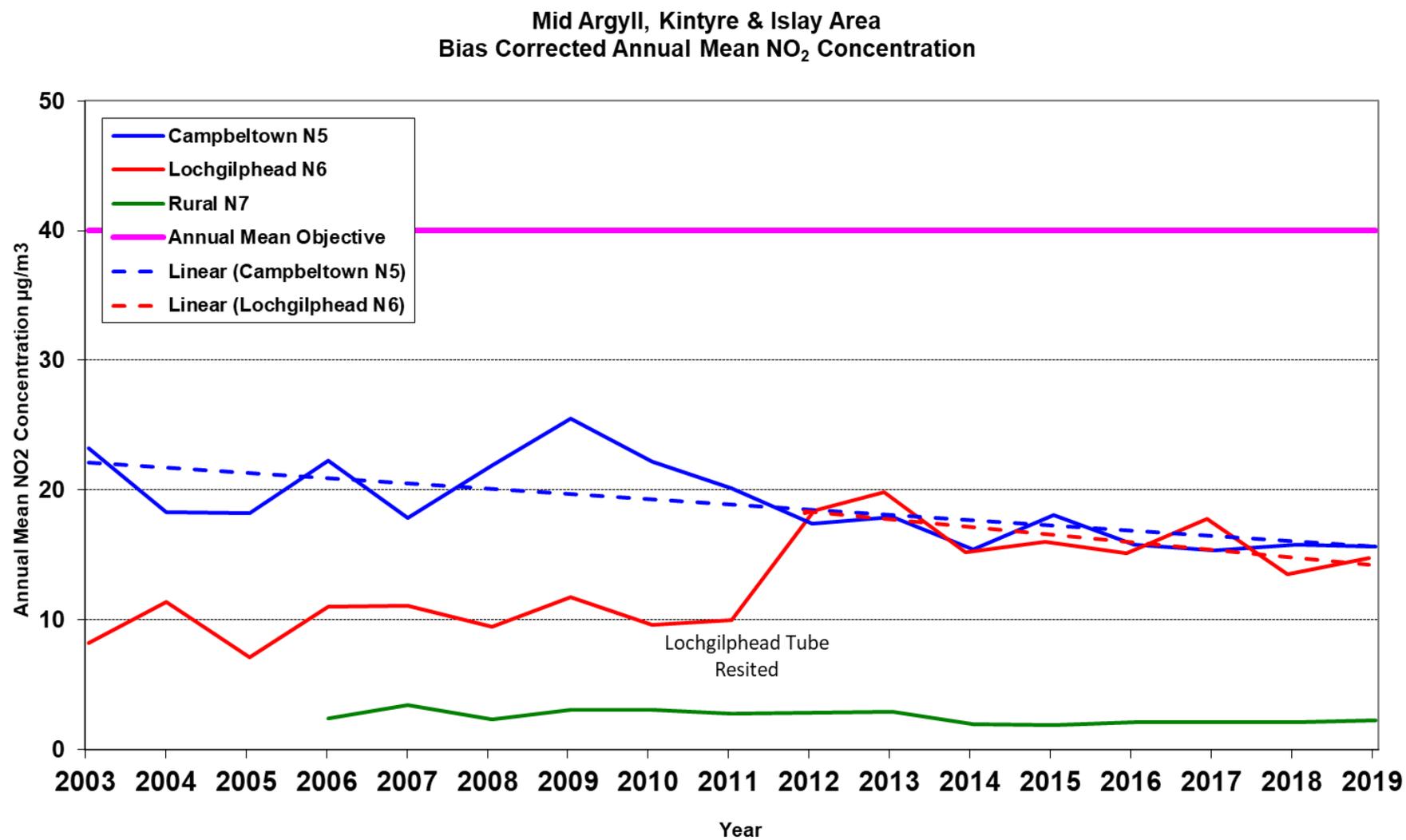
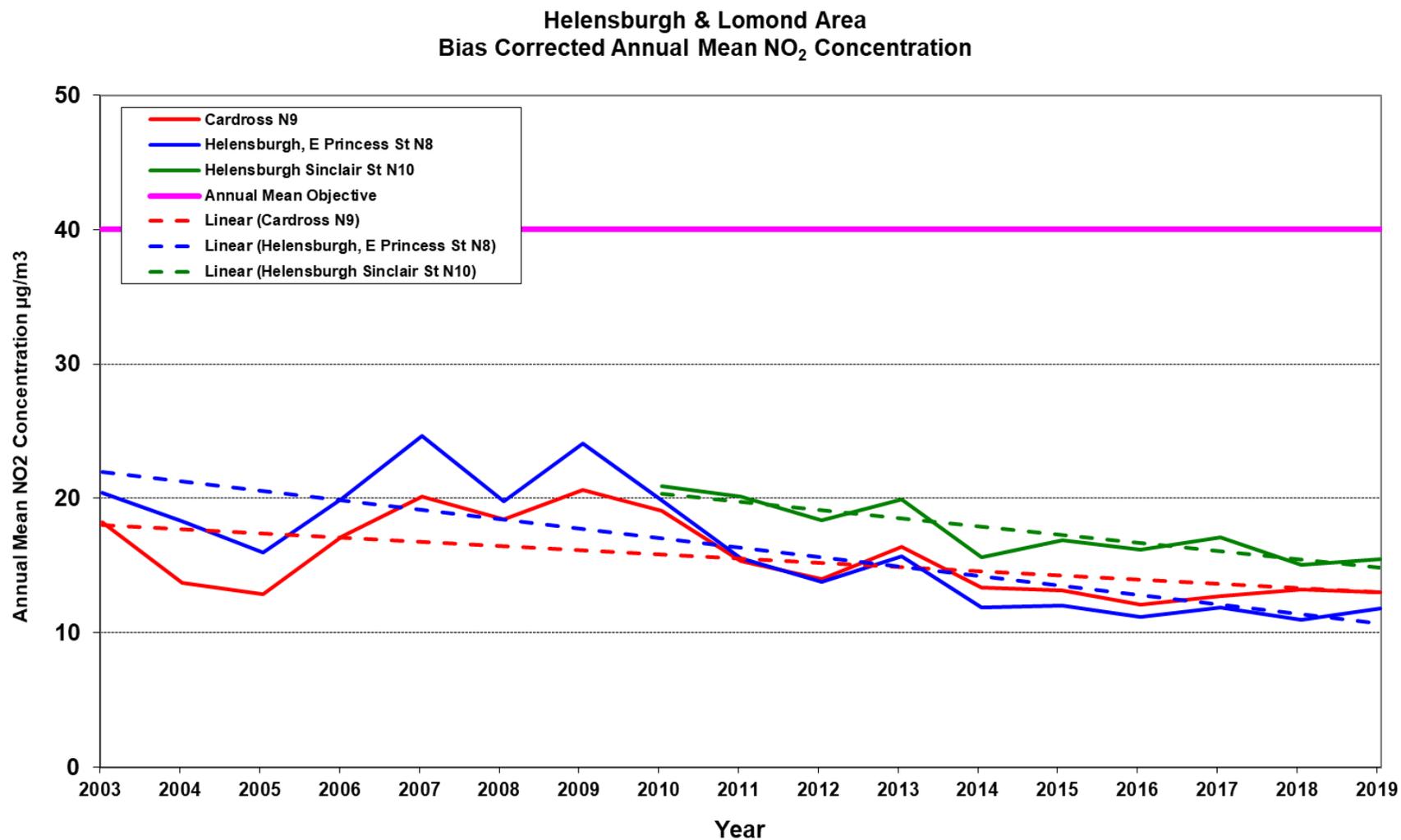


Figure 4 Graph of Annual NO<sub>2</sub> trends –Helensburgh and Lomond Area



## Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 – NO<sub>2</sub> Monthly Diffusion Tube Results for 2019

| Site ID | NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> ) |      |      |      |      |      |      |      |      |      |      |      | Annual Mean |                              |
|---------|--|------|------|------|------|------|------|------|------|------|------|------|-------------|------------------------------|
|         | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Raw Data    | Bias Adjusted <sup>(1)</sup> |
|         | N1   | 29.9 | 26.7 | 23.5 | 25.2 | 25.6 | 23.7 | 21.5 | 21.6 | 19.1 | 23.4 | 32.2 |             |                              |
| N2      | 36.0   | 31.5 |      | 25.3 | 21.6 | 19.1 | 18.4 | 20.5 | 20.3 | 20.6 | 25.4 | 18.8 | 23.4        | 20.1                         |
| N3      | 38.5   | 31.8 | 26.5 | 27.7 | 21.1 | 20.6 | 16.0 | 22.2 | 21.3 | 25.4 | 29.4 | 24.4 | 25.4        | 21.9                         |
| N4      | 27.3   | 19.8 | 13.8 | 19.2 | 13.0 | 12.8 | 9.5  | 9.2  | 12.3 | 12.3 | 23.6 | 16.2 | 15.8        | 13.5                         |
| N5      | 22.1   |      | 14.9 | 31.8 | 16.9 | 18.1 | 11.1 | 11.9 | 13.3 | 20.0 | 24.8 | 15.2 | 18.2        | 15.6                         |
| N6      | 29.0   | 18.3 | 17.1 | 18.6 | 14.5 | 13.7 | 12.0 | 11.9 | 15.7 | 18.2 | 23.4 | 13.6 | 17.2        | 14.8                         |
| N7      | 2.1  | 2.9  | 2.0  | 2.2  |      | 1.3  | 1.6  | 2.1  | 2.1  | 1.5  | 7.9  | 3.0  | 2.6         | 2.2                          |
| N8      |  | 36.1 | 11.7 | 13.7 | 9.6  | 8.8  | 5.6  | 7.3  | 9.9  | 11.8 | 22.7 | 13.5 | 13.7        | 11.8                         |
| N9      | 26.1   | 20.5 | 12.2 | 15.4 | 9.2  | 11.4 | 11.4 | 8.2  | 12.1 | 14.8 | 25.2 | 15.4 | 15.2        | 13.0                         |
| N10     | 25.5   | 26.1 | 18.1 | 17.3 | 14.1 | 14.4 | 14.6 | 12.6 | 13.6 | 17.8 | 23.6 | 18.4 | 18.0        | 15.5                         |

(1) See Appendix C for details on bias adjustment

## **Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC**

### **Diffusion Tube Bias Adjustment Factors**

Nitrogen dioxide diffusion tubes are supplied and analysed by Glasgow Scientific Services. The laboratory scored 100%, 100%, 100% and 50% in the 4 rounds of the AIR NO<sub>2</sub> PT assessment covering the period of the reported sampling results.

A bias adjustment factor was applied to the annual mean NO<sub>2</sub> concentrations for 2019. No local co-location studies in Argyll and Bute were available to produce bias adjustment factors. The factor of 0.86 was obtained from Spreadsheet Version Database\_Diffusion\_Tube\_Bias\_Factors\_v03\_20\_FINAL.xlsx<sup>10</sup> downloaded from <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

### **QA/QC of diffusion tube monitoring**

The NO<sub>2</sub> diffusion tubes are supplied and analysed by Glasgow Scientific Services and prepared by using 20% TEA in water. The duration of exposure is normally the 4/5 week period suggested by the calendar provided by Defra. Glasgow Scientific Services have adopted the procedures for preparation and analysis contained in the document "Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring:- Practical Guidance." Section 3 of this document also provides the basis for the operation of the Council's diffusion tube network.

Appendix D: Maps

Figure 5 Map of A Road Network and Electric Vehicle Charging Stations

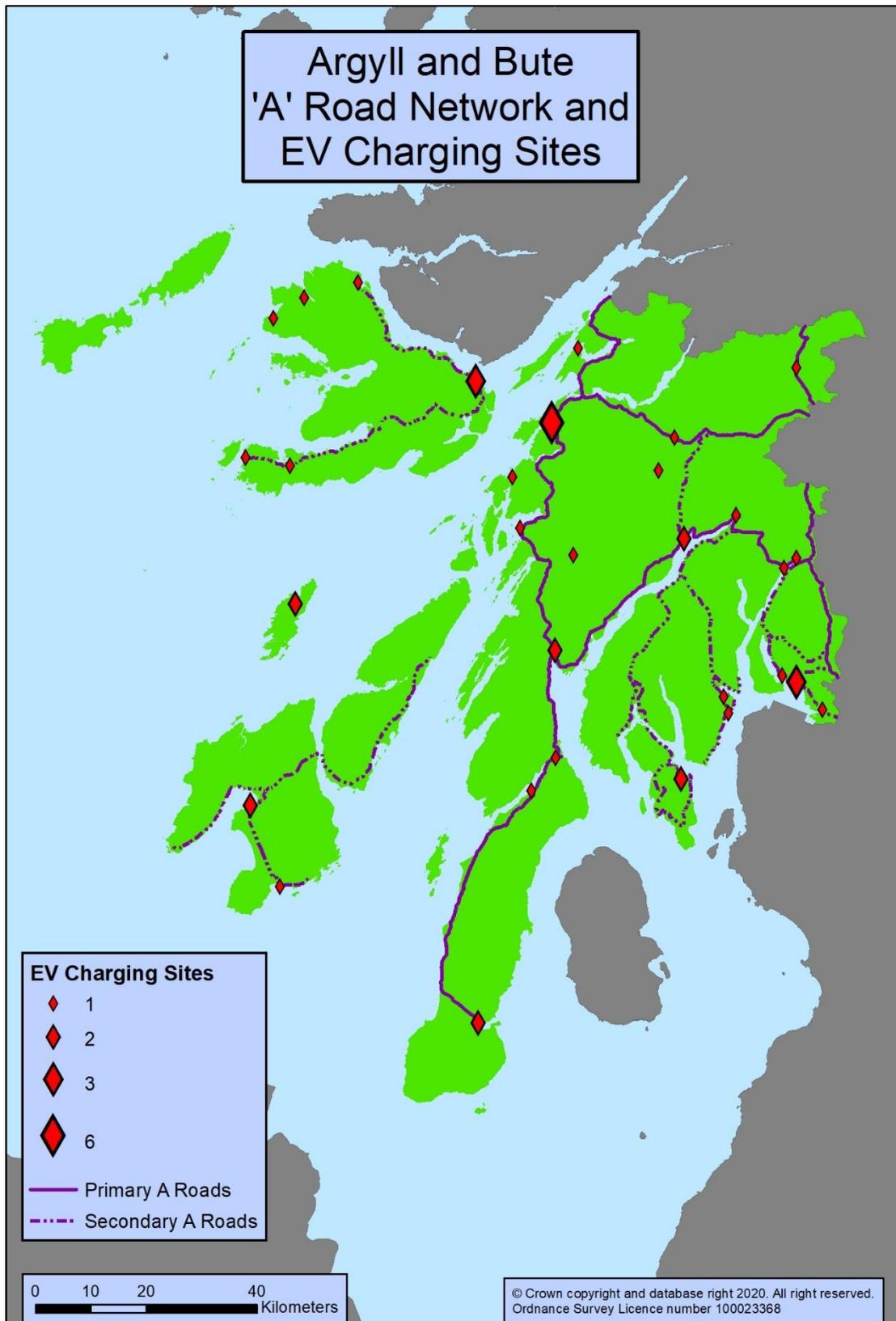


Figure 6 Map of A Road Network and Population Classification

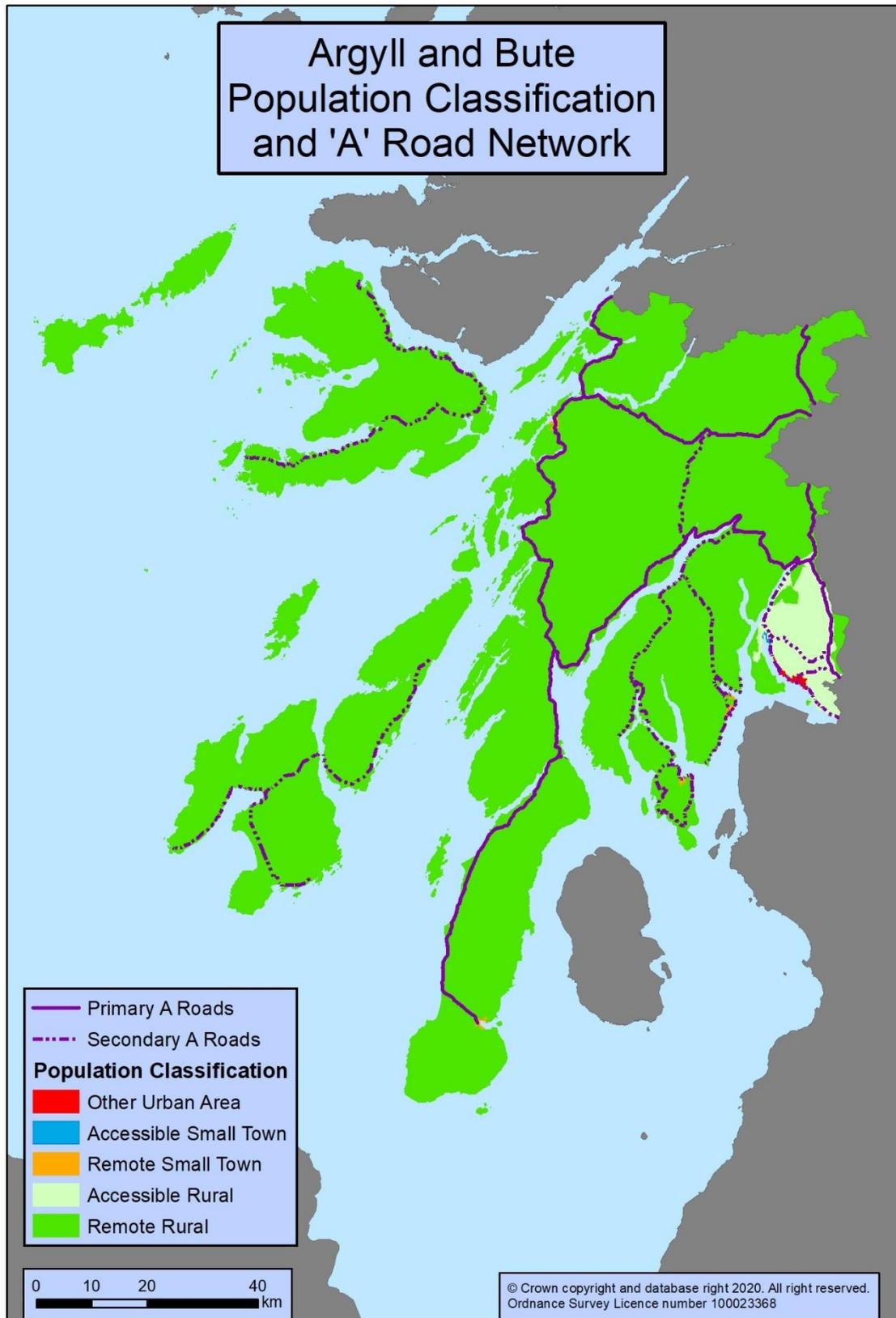


Figure 7 Map of Major Settlements and Population



Figure 8 Map of Transport Routes

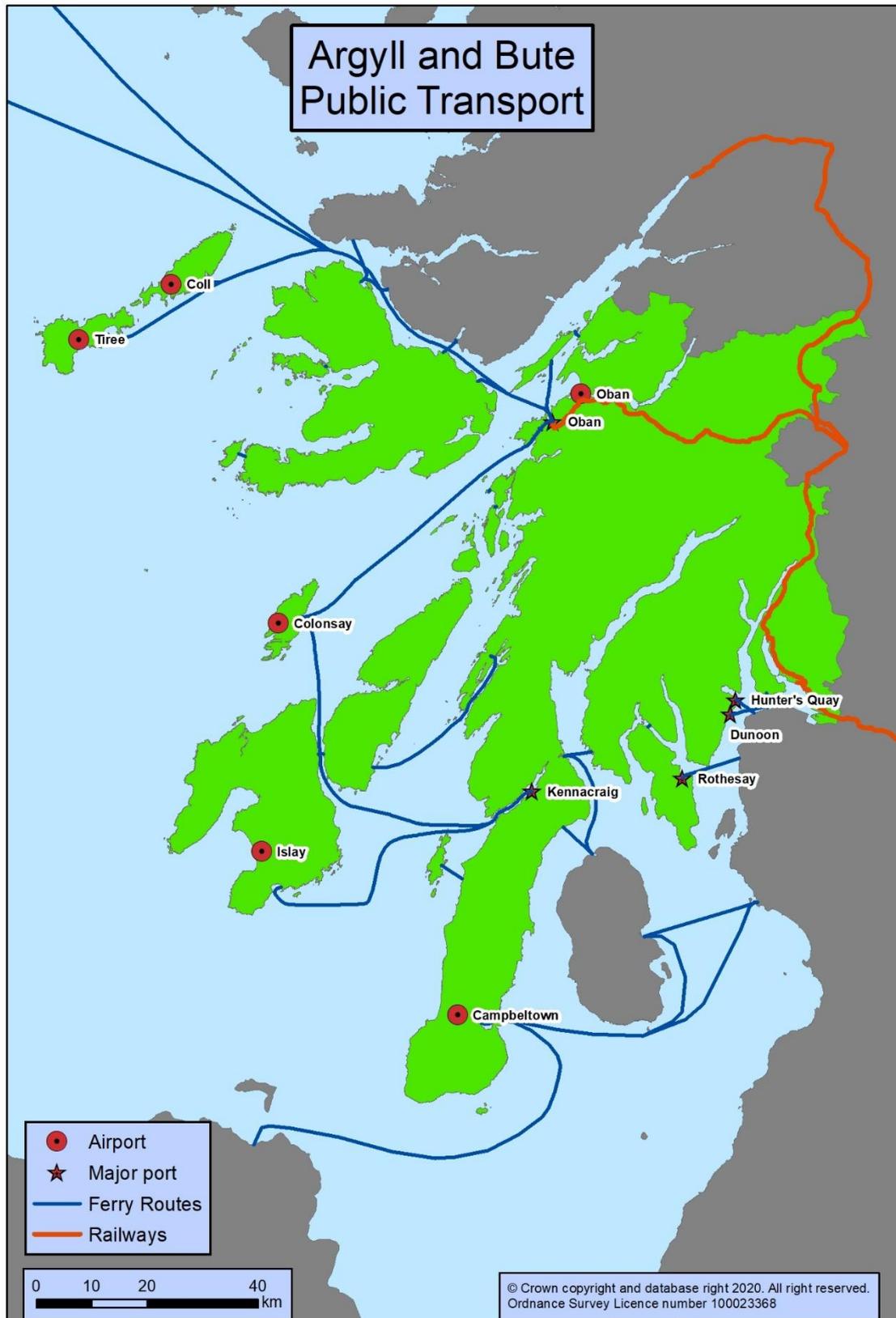


Figure 9 Map of Modelled Background NO<sub>2</sub> Annual Mean Concentration

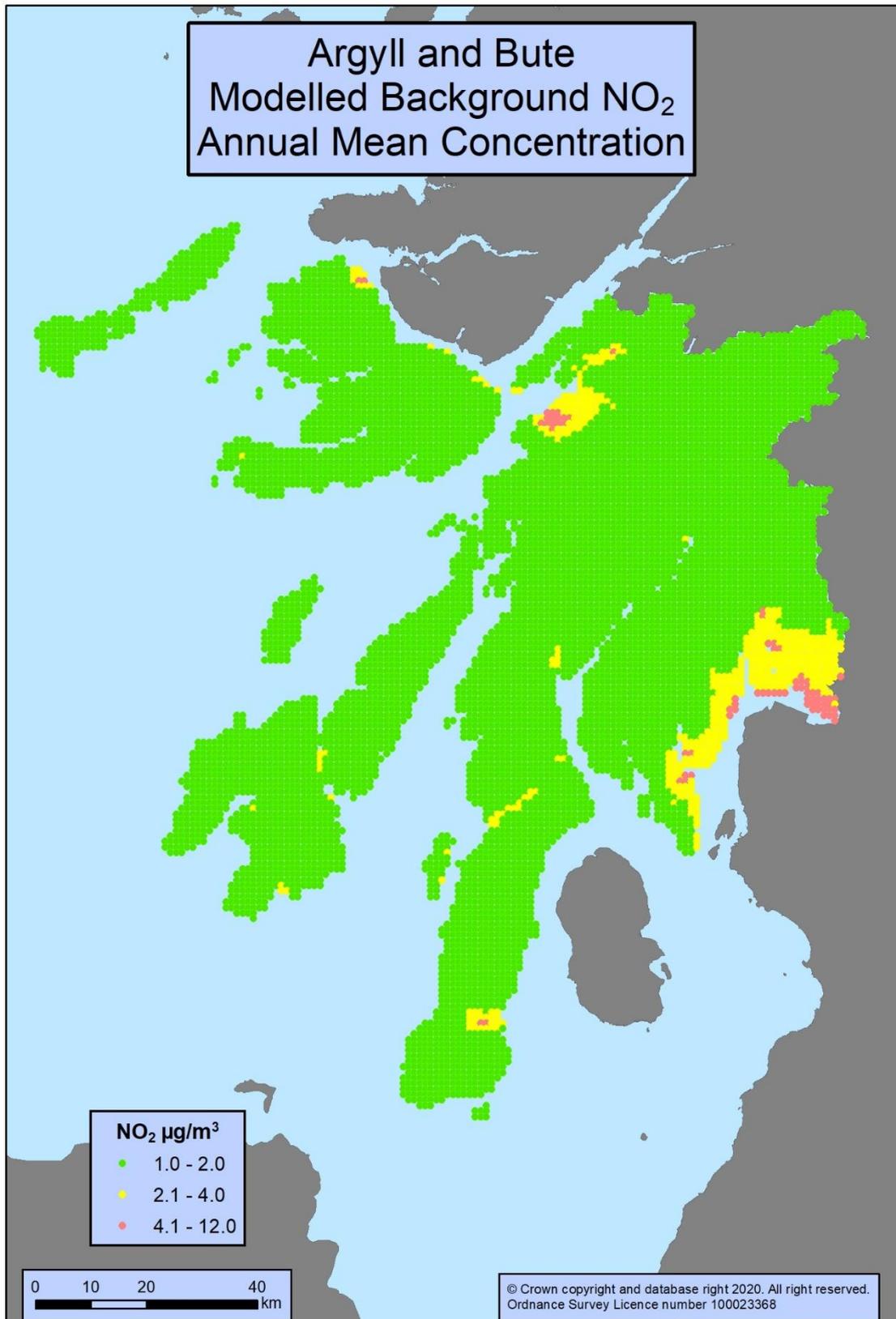


Figure 10 Map of Modelled Background PM<sub>10</sub> Annual Mean Concentration

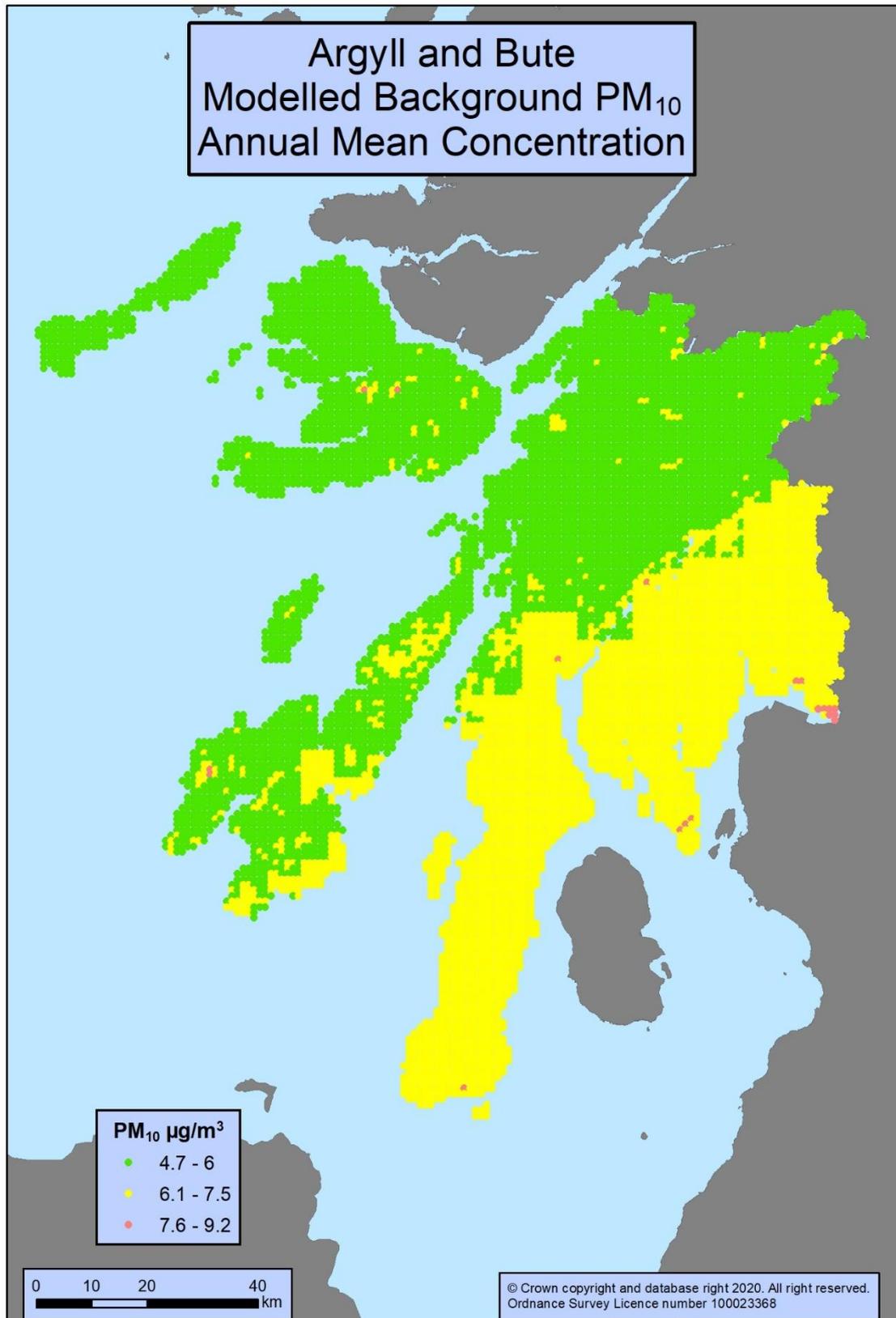


Figure 11 Map of Modelled Background PM<sub>2.5</sub> Annual Mean Concentration

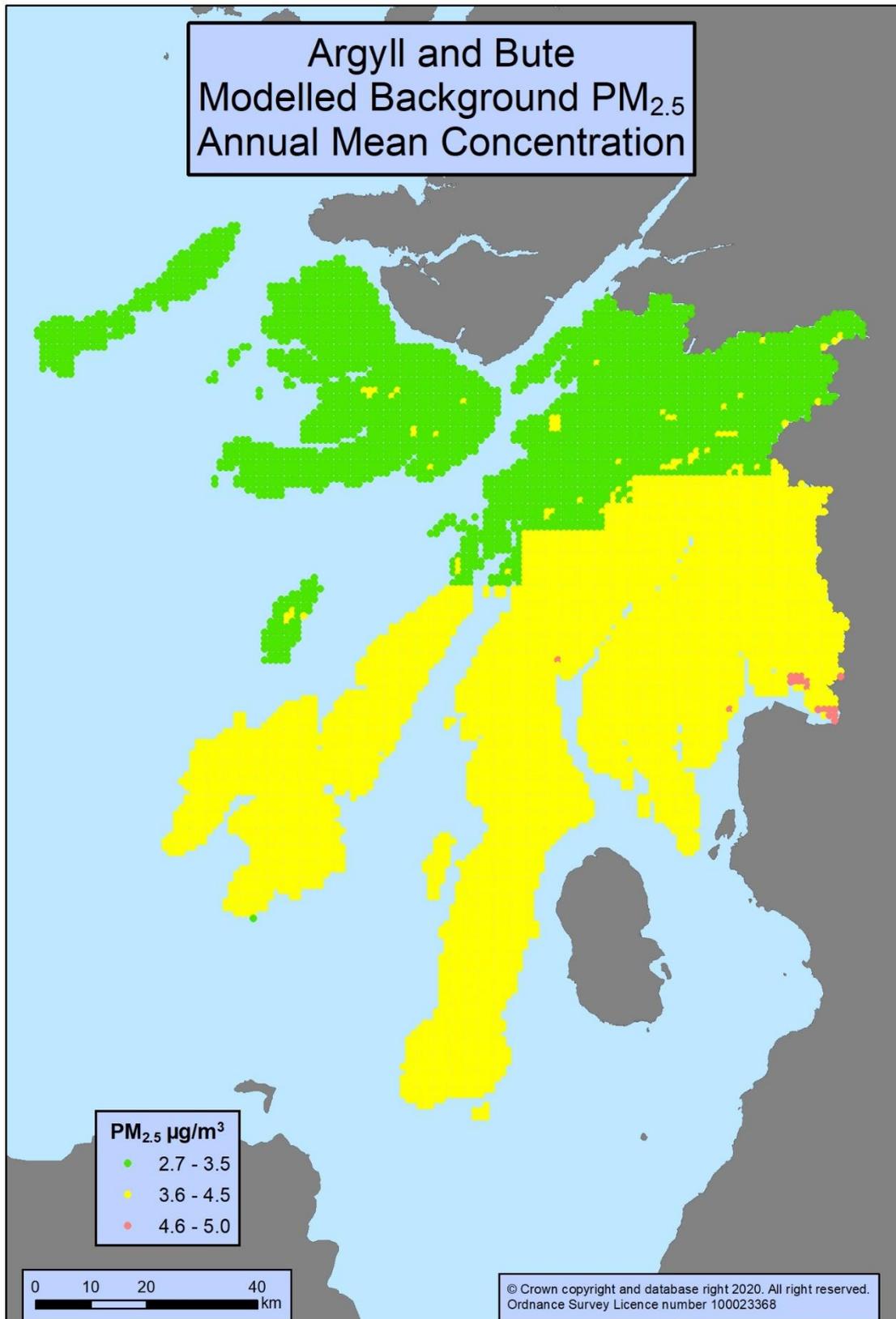




Figure 13 Map of Diffusion Tube Sites, Oban Town Centre

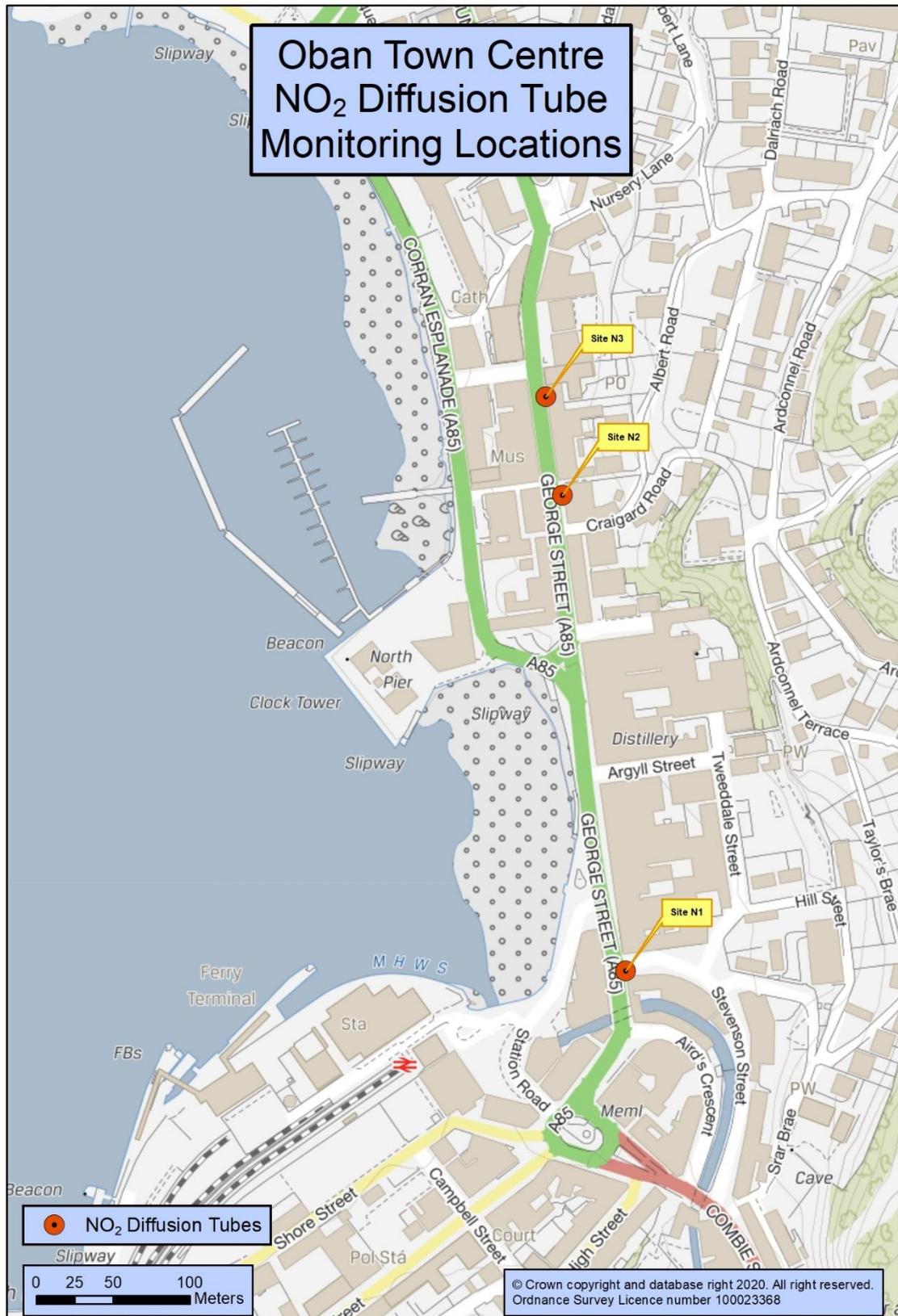


Figure 14 Map of Diffusion Tube Sites, Helensburgh Town Centre



Figure 15 Map of SEPA Permitted Process Sites



## 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   |
| EV                | Electric Vehicle  |
| 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) <http://www.scotland.gov.uk/Topics/Statistics/About/Methodology/UrbanRuralClassification>
- (2) [Argyll and Bute Council. Local development Plan.](#)
- (3) [Argyll and Bute Council. Economic Strategy.](#)
- (4) [Argyll and Bute Council, 2019 Air Quality Annual Progress Report, June 2019](#)
- (5) [Defra in partnership with the devolved administrations, Technical Guidance LAQM.TG\(16\), February 2018](#)
- (6) [Defra in partnership with the devolved administrations, Technical Guidance LAQM.TG\(09\), February 2009](#)
- (7) <http://www.scottishairquality.co.uk/data/mapping?view=data>
- (8) Argyll and Bute Council. Online access to planning applications is available at <http://publicaccess.argyll-bute.gov.uk/online-applications/>
- (9) Loch Lomond and Trossachs National Park Authority. Online access to planning applications is available at <https://eplanning.lochlomond-trossachs.org/OnlinePlanning/?agree=0>
- (10) <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>