# Moray Council

Air Quality Annual Progress Report 2024

Bureau Veritas

July 2024

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# Document Control Sheet

| Identification | |
|---|---|
| **Client** | Moray Council |
| **Document Title** | Moray Council – 2024 Annual Progress Report |
| **Bureau Veritas Ref No.** | AIR16258549 |

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| Configuration | | | | |
|---|---|---|---|---|
| **Version** | **Date** | **Author** | **Reason for Issue/Summary of Changes** | **Status** |
| v1.0 | 02/07/24 | S Garrington | Draft for comment | Draft |

| | Name | Job Title | Signature |
|---|---|---|---|
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# Annual Progress Report (APR)

2024 Air Quality Annual Progress Report (APR) for Moray Council

In fulfilment of Part IV of the Environment Act 1995, as amended by the Environment Act 2021

Local Air Quality Management

July 2024

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| **Report Reference Number** | 16258549_24 |
| **Date** | July 2024 |

# Executive Summary: Air Quality in Our Area

The following Annual Progress Report (APR) was prepared and written by Bureau Veritas on behalf of Moray Council in accordance with Local Air Quality Management (LAQM) Technical Guidance (TG(22)), published by Defra on behalf of the devolved administrations.

## Air Quality in Moray Council

There are no existing significant air quality issues identified within the Moray Council administrative area. The Council has examined the 2023 air quality monitoring results in its area and concludes that no new Detailed Assessments or AQMAs are required for any pollutant.

Atmospheric nitrogen dioxide ($NO_2$) is currently the only pollutant of concern within the Moray Council area and is monitored in urban areas via a network of passive diffusion tubes. The measured 2023 annual mean concentrations of $NO_2$ within the Moray Council area remain well below the Air Quality Standards (AQS) set by the Scottish Government. In summary, a maximum measured annual mean $NO_2$ concentration of 16.7 µg/m$^3$ was monitored at West Park Court, Elgin (monitoring site DT1), well below the annual mean $NO_2$ Scottish Air Quality Standard of 40 µg/m$^3$. This was an increase of approximately 0.7 µg/m$^3$ as compared to the 2022 monitoring results at the same site. Measured 2023 annual mean $NO_2$ concentrations show an increase compared to the 2022 results at 14 out of the 19 monitoring locations. It is likely that this increase was due to the full lift of restrictions associated with the COVID-19 pandemic and the full return to normal travel volumes within the council.

All sources of emissions from industry and transport remain unchanged from those reported in the 2023 APR.

## Actions to Improve Air Quality

Although there are currently no designated AQMAs within the Moray Council area and thus, no specific planned actions to implement air quality improvement measures, Moray

Council is addressing air quality through local policies and plans and works to manage local air quality through a monitoring network within the Council area.

The Moray Council Active Travel Strategy was updated and adopted on 15th November 2022. The new Moray Council Active Travel Strategy covers 2022-2027 and sets out how Moray Council will encourage more non-motorised travel within Moray through a series of programmes of direct measures and behaviour change programmes. The plan embeds the ethos that Active Travel has many benefits to both communities and individuals and has a number of positive outcomes for public health, social inclusion, reducing the environmental impact of transport and for supporting local economic activity. More information on the strategy can be found at:

http://www.moray.gov.uk/moray_standard/page_75724.html

The Second Moray Local Transport Strategy (2011) (Ref-4) applies to the Moray Council area and sets out a framework for taking forward transport policy and infrastructure. The strategy is split into two parts to firstly set out the seven key transport topics, and then the progress to date and policy guidance.

The Elgin Transport Strategy was adopted in August 2017 and develops ways to help people become more active, walking and cycling more often, and promotes more use of public transport. The policy has developed for the Elgin area within Moray Council. The policy aims to achieve its transport goals over a 13-year period through improvements to the transport network, promotion of public transport and contribution to review of the Moray Local Development Plan.

## Local Priorities and Challenges

Moray Council has no specific priorities for the coming year for the improvement of air quality in its area but will continue monitoring at the existing diffusion tube sites in the area to identify any future changes in pollution concentrations.

## How to Get Involved

Members of the public can contribute to improving local air quality by taking alternative modes of transport where possible, becoming part of a cycle to work scheme, walking short distances instead of driving and when driving is unavoidable, taking part in car

sharing schemes. Detailed information on local transport and links to major travel means can be found at:
www.moray.gov.uk/moray_standard/page_1677.html

If you have any concerns or require further information on air quality, please contact Environmental Health or visit the Moray Council website at www.moray.gov.uk and search for “air quality”.

The previous LAQM reporting, including the 2023 APR, is available on the Moray Council website at: www.moray.gov.uk/moray_standard/page_1790.html.

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# 1 Local Air Quality Management

This report provides an overview of air quality in Moray Council during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 Moray 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 Concentration | Air Quality Objective Measured as | Date to be Achieved by |
|---|---|---|---|
| Nitrogen dioxide ($NO_2$) | 200 µg/m$^3$ not to be exceeded more than 18 times a year | 1-hour mean | 31.12.2005 |
| Nitrogen dioxide ($NO_2$) | 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 |
| Particulate Matter ($PM_{10}$) | 18 µg/m$^3$ | Annual mean | 31.12.2010 |
| Particulate Matter ($PM_{2.5}$) | 10 µg/m$^3$ | Annual mean | 31.12.2021 |
| Sulphur dioxide ($SO_2$) | 350 µg/m$^3$, not to be exceeded more than 24 times a year | 1-hour mean | 31.12.2004 |
| Sulphur dioxide ($SO_2$) | 125 µg/m$^3$, not to be exceeded more than 3 times a year | 24-hour mean | 31.12.2004 |
| Sulphur dioxide ($SO_2$) | 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 |

# 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 publish and implement an Air Quality Action Plan (AQAP) within the shortest possible time and no later than 12 months of the date of AQMA Designation Order. The AQAP must set out measures the local authority intends to put in place in pursuit of the objectives within the shortest possible time Measures should be provided with milestones and a final date for completion. The action plan itself should have a timescale for completion and for revocation of the AQMA. Where measures to reduce air pollution may require a longer timescale an action plan shall be reviewed and republished within five years of initial publication and then five-yearly thereafter.

Moray Council currently does not have any AQMAs.

## 2.2 Cleaner Air for Scotland 2

Cleaner Air for Scotland 2 – Towards a Better Place for Everyone (CAFS2) is Scotland's second air quality strategy. CAFS2 sets out how the Scottish Government and its partner organisations propose to further reduce air pollution to protect human health and fulfil Scotland's legal responsibilities over the period 2021 – 2026. CAFS2 was published in July 2021 and replaces Cleaner Air for Scotland – The Road to a Healthier Future (CAFS), which was published in 2015. CAFS2 aims to achieve the ambitious vision for Scotland "to have the best air quality in Europe". A series of actions across a range of policy areas are outlined, a summary of which is available on the Scottish Government's website.

Progress by Moray Council against relevant actions for which local authorities are the lead delivery bodies within this strategy is demonstrated below.

### 2.2.1 Placemaking – Plans and Policies

Local authorities with support from the Scottish Government will assess how effectively air quality is embedded in plans, policies, City Deals and other initiatives, and more generally in cross departmental working, identifying, and addressing evidence, skills, awareness, and operational gaps.

The Active Travel Strategy (Ref-2) aims to build on the increase in walking and cycling in Moray from 2022-2027. The plan emphasises that Active Travel offers numerous benefits to both communities and individuals, including positive impacts on public health, social inclusion, environmental sustainability, and local economic development. Further detail on the Active Travel Strategy is found in section 2.3.3.

### 2.2.2 Transport – Low Emission Zones

Local authorities working with Transport Scotland and SEPA will look at opportunities to promote zero-carbon city centres within the existing LEZs structure.

Moray Council has no Low Emission Zones established within the Local Authority area.

The Moray Council's Climate Change Strategy 2020-2030[1] dedicates a strategy theme towards transport within the council jurisdiction and provides a framework aimed at reducing carbon emissions and preparing for the unavoidable impacts of changing weather patterns through the period 2020-2030 and beyond. The strategy focuses on infrastructure improvements (e.g. sustainable transport options to reduce congestion). Moving away from carbon-intensive, private transport towards decarbonised, more efficient, more active forms of travel will assist the council to achieve Net-Zero emission targets.

### 2.2.3 – Further Air Quality Actions

Moray Local Development Plan

Formally adopted on 27 July 2020, the Moray Local Development Plan 2020 (Ref-1) sets how the Council sees the area developing over the next 10 years and beyond, including the following two policies that are relevant to air quality:

- Policy EP 14 'Pollution' aims to ensure that new developments do not create pollution which could adversely affect the environment or local amenity. It states

[1] http://www.moray.gov.uk/downloads/file136442.pdf

that "*Development proposals which may cause significant air, water, soil, light or noise pollution or exacerbate existing issues must be accompanied by a detailed assessment report on the levels, character and transmission of the potential pollution with measures to mitigate impacts. Where significant or unacceptable impacts cannot be mitigated, proposals will be refused."*,and

- Policy DP 9 'Renewable Energy' aims to consider renewable energy proposals favourably while avoiding adverse impacts on air quality. It states that "*detailed assessment of impacts will include consideration of the extent to which the proposal contributes to renewable energy generation targets, its effect on greenhouse gas emissions*.".

In addition, the Development Plan Scheme 2023 was released in December 2023 and sets a proposed timetable for the review and preparation of the development plan and explains how we will engage with community, business, and other interested parties. It will set out the key milestones for the preparation of the Moray Local Development Plan 2027. The below information provides a timeline for the adoption of the Moray Local Development Plan 2027:

• Gathering data to inform direction of plan and engagement with communities and stakeholders – 2023

• Publish Evidence Report and submit to Scottish Ministers for review – 2024.

• Following approval by Council on 24 April 2024 the Evidence Report has been submitted to the Scottish Government Division for Planning and Environmental Appeals (DPEA).

• Prepare and publish Proposed Plan for consultation - 2025

• Examination of plan - 2026

• Adoption of plan - 2027

<u>Moray Council Active Travel Strategy</u>

Moray Council adopted the Moray Council Active Travel Strategy 2022-2027 (Ref- 2) in November 2022. This strategy outlines Moray Council's approach to promoting non-motorised travel within Moray through a combination of direct initiatives and behaviour change programs. Implementation will involve the Council's own efforts to promote sustainable and active travel, collaboration across various Council departments, and

ongoing partnerships with external funders, the community, and other stakeholders. Active travel encompasses all forms of non-motorised travel, encouraging physical activity and benefiting both health and the environment.

The Active Travel Strategy objectives are:

1. Increase the number of active travel journeys made within Moray.
2. Increase the modal share of both walking and cycling journeys to work and school.
3. Contribute to a reduction in the number of motorised journeys made within Moray.
4. Create and maintain a comprehensive network of safe and user-friendly infrastructure for active travel that meets people's needs.
5. Implement a programme of activities designed to encourage more people to travel actively more often.
6. Raise awareness of the active travel network and the benefits of travelling actively.

Elgin Transport Strategy

Moray Council adopted the Elgin Transport Strategy (Ref-3) in August 2017. The strategy:

- Sets out proposals for improvements to the transport network across the city of until 2030 including roads, junctions, crossings and cycle routes.
- Develops ways to help people become more active, walking and cycling more often and promotes more use of public transport; and
- Helps to shape the future development of Elgin by contributing to the next review of the Moray Local Development Plan (Ref-1).

Additionally, the Second Moray Local Transport Strategy (MLTS2) (Ref- 4) has been prepared in order to help plan for improved transport infrastructure and services within Moray. MLTS2 is divided into two sections. Part One details the main strategy, outlining primary and secondary objectives, action plans, and committed schemes across seven key areas: Active Travel, Public Transport, Ports and Harbours, Roads, Freight Transport, Travel Behaviour, and Traffic Management. Part Two provides a summary of the

background information, achievements to date, key issues, and connections with other National, Regional, and Local policies and guidance, as well as relationships with other key agencies.

## 2.3 Implementation of Air Quality Action Plan(s) and/or measures to address air quality

In order to ensure that local authorities implement the measures within an action plan by the timescales stated within that plan, the Scottish Government expects authorities to submit updates on progress through the APR process. Moray Council has taken forward a number of measures within the action plan during the current reporting year of 2023 in pursuit of improving local air quality and meeting the air quality objectives within the shortest possible time. Details of all measures completed, in progress or planned are set out in

Table 2.1.

Regarding the Active Travel Strategy (2022-2027), the main objectives are outlined below:

1. Further develop the Active Travel network

2. Develop Active Travel Masterplans for key settlements in Moray

3. Embed Active Travel opportunities within new developments

4. Encourage and facilitate walking and cycling as leisure and tourist activities to provide benefits to health and local economy

5. Provide new/improved cycle parking/ facilities at key destinations and transport interchanges in Moray

6. Work with local employers (including Moray Council) and their staff to encourage more walking and cycling to and from work

7. Work with students and school pupils, staff and parents to encourage more walking, cycling and scooting to and from school/ further education

8. Continue to seek funding from existing sources and Identify new funding opportunities as they emerge to secure funding for Active Travel interventions, as appropriate.

The Bus Revolution Scheme is an innovative project that aims to increase the number of people using public transport to get to and from rural areas to places of work, education and leisure, providing a step change in availability of low-emission public transport. The project has currently procured six electric buses.

The council's fleet is used by employees to conduct council business and deliver services for the people of Moray. It comprises over 500 cars, vans, buses, trucks, specialist vehicles and vessels. The Zero Emission Fleet Replacement Strategy details the council's plans to decarbonise the remainder of the fleet in line with the Scottish Government's net zero targets.

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## Table 2.1 – Progress on Measures to Improve Air Quality

| Measure No. | Measure | Category | Expected/Actual Completion year | Measure Status | Funding Status | Key Milestones | Progress | Barriers to implementation |
|---|---|---|---|---|---|---|---|---|
| 1 | Active Travel Strategy | Policy guidance and development control | N/A | In Progress | Partially Funded | N/A | Further development to the Active Travel network. | None |
| 2 | Bus Revolution Project | Promoting low emission transport | N/A | In Progress | Partially Funded | Procurement of six electric buses - Q1 24 | Project set to enter delivery | Inability to raise private sector funding to support the financial model (e.g. Company purchased season tickets). |
| 3 | Council Fleet Decarbonisation | Vehicle fleet efficiency | N/A | In Progress | Partially Funded | N/A | Electric pool cars are now available for council staff to use for work visits | Difficulties in the global vehicle market has led to a slowdown in the availability of electric vehicles for the council's planned fleet replacement programme. |

# 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

Moray Council does not undertake any automatic (continuous) monitoring within the authority's area.

### 3.1.2 Non-Automatic Monitoring Sites

Moray Council undertook non- automatic (passive) monitoring of $NO_2$ at 19 sites during 2023. Table A.1 in Appendix A shows the details of the sites. There has been no additional non-automatic monitoring locations or changes to existing locations since the 2022 reporting year.

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.

### 3.1.3 Other Monitoring Activities

No additional monitoring activities were undertaken by Moray Council in 2023.

## 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 ($NO_2$)

Table A.4 in Appendix A compares the adjusted monitored $NO_2$ annual mean concentrations for the past five years with the air quality objective of 40 µg/m$^3$ at non automatic monitoring sites.

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B.

No automatic monitoring has been undertaken within Moray Council's area of jurisdiction, and so it is not possible to directly compare the measured data to the 1-hour mean air quality objective. A proxy value of 60 µg/m$^3$ has been utilised to identify any potential exceedences of the 1-hour mean objective. Analysis of long-term monitoring data suggests that if a measured annual mean $NO_2$ concentration is less than 60 µg/m$^3$ then the 1-hour mean $NO_2$ ojective is likely to be met in accordance with LAQM.TG(22) (Ref-5). There are no monitored $NO_2$ annual average concentrations of 60 µg/m$^3$ or greater within Moray Council within 2023.

Several monitoring periods in 2023 recorded values below the limit of detection (shown as 5 µg/m$^3$ in Table B.1 in Appendix B. These are likely to be a result of diffusion tubes perfomance at lower concentrations. Where concentrations have been measured as below the limit of detection, these have been assumed to be 5 µg/m$^3$ to adopt a conservative approach.

Measured $NO_2$ concentrations at all diffusion tube locations were well below the annual mean obective. The highest $NO_2$ annual average concentration during 2023 was 16.7 µg/m$^3$ at Elgin 1. The measured 2023 annual mean concentrations of $NO_2$ within the Moray Council area remain well below the 40 µg/m$^3$ Air Quality Standard (AQS) set by the Scottish Government.

Measured annual average $NO_2$ concentrations across the Moray Council area either increased or remained at the same concentration for all locations, except Elgin 8, Elgin 9, and Rothes 1 in comparison to the 2022 data set. The largest increases were observed at Keith 1 with a increase in $NO_2$ concentrations of 1.2 µg/m$^3$.

During 2023, the LAQM calendar of suggested exposure was followed during all monitoring periods.

As all monitored $NO_2$ concentrations across the Moray Council area are well below the annual average objectives, it is not considered necessary to declare any new AQMAs within Moray Council.

### 3.2.2 Particulate Matter ($PM_{10}$)

Moray Council does not undertake any monitoring for $PM_{10}$ and does not expect $PM_{10}$ concentrations to exceed AQS(S) objectives.

### 3.2.3 Particulate Matter ($PM_{2.5}$)

Moray Council did not undertake $PM_{2.5}$ monitoring during 2023 and has no current future plans to undertake such. It is not anticipated that $PM_{2.5}$ concentrations within Moray Council exceed the relative air quality objective.

### 3.2.4 Sulphur Dioxide ($SO_2$)

Sulphur dioxide is not monitored within the Moray Council area. It is not expected that existing $SO_2$ emissions will cause $SO_2$ objectives to be exceeded.

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

There is no monitoring of carbon monoxide, lead or 1,3-Butadiene within the Moray Council area. It is not expected that existing emissions of carbon monoxide, lead or 1,3-Butadiene will exceed the AQS(S) objectives.

# 4 New Local Developments

## 4.1 Road Traffic Sources

There have been no new planning applications for local developments of road traffic sources in 2023.

## 4.2 Other Transport Sources

There have been no planning applications for local developments of other transport sources in 2023.

## 4.3 Industrial Sources

There have been no planning applications for local developments of industrial sources in 2023.

## 4.4 Commercial and Domestic Sources

There have been no planning applications for local developments of commercial or domestic sources in 2023.

## 4.5 New Developments with Fugitive or Uncontrolled Sources

There have been no planning applications for local developments of commercial and domestic sources in 2023.

# 5 Planning Applications

There were no known planning applications during 2023 for new developments which may affect air quality within the Moray Council administrative area.

# 6 Conclusions and Proposed Actions

## 6.1 Conclusions from New Monitoring Data

The results of the $NO_2$ monitoring across the Moray Council area during 2023 confirm that there are no exceedances of the annual average $NO_2$ objectives. During 2023, the monitoring data shows an increase at 13 sites and remaining constant with 2022 concentrations at 3 sites. The average difference in $NO_2$ annual mean concentration across all sites from 2022 to 2023 is an increase of 0.5 µg/m³. The largest increase in $NO_2$ annual mean concentration from 2022 to 2023 occurred at Elgin 10, with an increase of 2.7 µg/m³.

Kerbside and roadside sites generally show higher $NO_2$ concentrations compared to urban background sites, reflecting the direct impact of vehicular emissions.

Many sites show a notable decrease in $NO_2$ concentrations from 2019 to 2020, likely influenced by reduced traffic and industrial activity during the COVID-19 pandemic. Post-2020, the concentrations at several sites tend to stabilise or slightly increase, reflecting a gradual return to pre-pandemic activity levels.

## 6.2 Conclusions relating to New Local Developments

There were no known planning applications during 2023 for new developments which may affect air quality within the Moray Council administrative area.

## 6.3 Proposed Actions

The monitoring data for 2023 does not identify any exceedances of the $NO_2$ objectives within the Moray administrative area. There are no other exceedances for other pollutants expected within the Moray administrative area within 2023.

Monitored concentrations of $NO_2$ within the Moray Council administrative area show that Post-2020, the data shows variability with no consistent upward or downward trend, indicating a stabilisation of $NO_2$ levels with minor fluctuations influenced by local factors such as traffic, weather, and other activities. This indicates no additional requirements for

additional air quality monitoring, or any further measures, plans, or actions to manage air quality within the Moray Council administrative area.

# 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? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| Elgin 1 | Elgin 1 | Kerbside | 321107 | 862668 | $NO_2$ | NO | <5 | 1.0 | N | 3.0 |
| Elgin 2 | Elgin 2 | Kerbside | 322348 | 862745 | $NO_2$ | NO | <2 | 1.0 | N | 3.0 |
| Elgin 3 | Elgin 3 | Roadside | 322328 | 861206 | $NO_2$ | NO | <22 | 6.0 | N | 3.0 |
| Elgin 4 | Elgin 4 | Roadside | 322557 | 826356 | $NO_2$ | NO | <18 | 3.0 | N | 3.0 |
| Elgin 5 | Elgin 5 | Kerbside | 322233 | 861869 | $NO_2$ | NO | <5 | 1.0 | N | 3.0 |
| Elgin 6 | Elgin 6 | Kerbside | 322029 | 862832 | $NO_2$ | NO | <5 | 1.0 | N | 3.0 |
| Elgin 7 | Elgin 7 | Roadside | 321615 | 862307 | $NO_2$ | NO | <5 | 1.0 | N | 3.0 |

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| Elgin 8 | Elgin 8 | Roadside | 322492 | 863309 | $NO_2$ | NO | <5 | 2.0 | N | 3.0 |
| Elgin 9 | Elgin 9 | Kerbside | 321775 | 861115 | $NO_2$ | NO | 5.0 | 2.0 | N | 3.0 |
| Elgin 10 | Elgin 10 | Kerbside | 320641 | 862291 | $NO_2$ | NO | 5.0 | 1.0 | N | 3.0 |
| Elgin 11 | Elgin 11 | Roadside | 321463 | 863794 | $NO_2$ | NO | <21 | 5.0 | N | 3.0 |
| Fochabers 1 | Fochabers 1 | Kerbside | 334634 | 858726 | $NO_2$ | NO | <2 | 2.0 | N | 3.0 |
| Buckie 1 | Buckie 1 | Roadside | 342562 | 865535 | $NO_2$ | NO | 0 | 5.0 | N | 3.0 |
| Forres | Forres | Urban Background | 303726 | 858931 | $NO_2$ | NO | <2 | n/a | N | 3.0 |
| Keith 1 | Keith 1 | Roadside | 342592 | 850894 | $NO_2$ | NO | 0 | 6.0 | N | 3.0 |

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| Keith 2 | Keith 2 | Kerbside | 343329 | 850415 | $NO_2$ | NO | <5 | 2.0 | N | 3.0 |
| Lossie 1 | Lossie 1 | Kerbside | 322463 | 870293 | $NO_2$ | NO | <5 | 2.0 | N | 3.0 |
| Aberlour 1 | Aberlour 1 | Roadside | 326571 | 842899 | $NO_2$ | NO | <3 | 4.0 | N | 3.0 |
| Rothes 1 | Rothes 1 | Kerbside | 327756 | 849658 | $NO_2$ | NO | <5 | 2.0 | N | 3.0 |

**Notes:**

(1) 0m 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 $NO_2$ Monitoring Results: Non-Automatic Monitoring (µg/m$^3$)**

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2022 (%) (2) | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Elgin 1 | 321107 | 862668 | Kerbside | 100.0 | 100.0 | 22.7 | 15.4 | 17.3 | 16.0 | 16.7 |
| Elgin 2 | 322348 | 862745 | Kerbside | 100.0 | 100.0 | 22.2 | 14.9 | 16.2 | 15.3 | 15.9 |
| Elgin 3 | 322328 | 861206 | Roadside | 100.0 | 100.0 | 11.4 | 6.0 | 6.4 | 5.6 | 6.1 |
| Elgin 4 | 323557 | 826356 | Roadside | 100.0 | 100.0 | 10.1 | 7.1 | 8.1 | 7.4 | 8.1 |
| Elgin 5 | 322233 | 861869 | Kerbside | 100.0 | 100.0 | 16.0 | 10.4 | 10.9 | 10.8 | 10.8 |
| Elgin 6 | 322029 | 862832 | Kerbside | 100.0 | 100.0 | 16.0 | 9.8 | 12.4 | 10.0 | 10.7 |
| Elgin 7 | 321615 | 862307 | Roadside | 100.0 | 100.0 | 9.8 | 7.0 | 8.8 | 7.7 | 8.5 |
| Elgin 8 | 322492 | 863309 | Roadside | 100.0 | 100.0 | 11.3 | 9.4 | 9.8 | 9.2 | 8.9 |
| Elgin 9 | 321775 | 861115 | Kerbside | 100.0 | 100.0 | 7.3 | 5.2 | 7.6 | 4.9 | 4.8 |
| Elgin 10 | 320641 | 862291 | Kerbside | 100.0 | 100.0 | 12.7 | 9.5 | 10.7 | 8.6 | 11.3 |
| Elgin 11 | 321447 | 863764 | Roadside | 100.0 | 100.0 | 18.1 | 13.7 | 13.7 | 13.5 | 13.7 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) [1] | Valid Data Capture 2022 (%) [2] | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Fochabers 1 | 334634 | 858726 | Kerbside | 100.0 | 100.0 | 8.5 | 6.1 | 6.7 | 6.3 | 6.9 |
| Buckie 1 | 342562 | 865535 | Roadside | 100.0 | 100.0 | 9.5 | 7.4 | 8.0 | 7.1 | 7.6 |
| Forres | 303726 | 858931 | Urban Background | 100.0 | 100.0 | 10.9 | 7.4 | 8.7 | 6.5 | 7.4 |
| Keith 1 | 342592 | 850894 | Roadside | 100.0 | 100.0 | 18.7 | 12.7 | 14.6 | 12.4 | 13.6 |
| Keith 2 | 343329 | 850415 | Kerbside | 100.0 | 100.0 | 17.6 | 12.4 | 13.5 | 13.0 | 13.4 |
| Lossie 1 | 323515 | 870931 | Kerbside | 100.0 | 100.0 | 5.4 | 4.5 | 4.4 | 4.0 | 4.0 |
| Aberlour 1 | 326571 | 842899 | Roadside | 100.0 | 100.0 | 13.1 | 8.1 | 9.1 | 9.2 | 9.3 |
| Rothes 1 | 327756 | 849658 | Kerbside | 100.0 | 100.0 | 12.5 | 9.1 | 10.5 | 9.3 | 8.7 |

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

**Notes:**

Exceedances of the $NO_2$ annual mean objective of 40µg/$m^3$ are shown in bold.

$NO_2$ annual means exceeding 60µg/$m^3$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG(22) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

# Appendix B: Full Monthly Diffusion Tube Results for 2023

**Table B.1 – $NO_2$ 2023 Monthly Diffusion Tube Results (µg/m$^3$)**

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean: Raw Data | Annual Mean: Annualised and Bias Adjusted (0.73) | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elgin 1 | 321107 | 862668 | 27.0 | 30.0 | 25.0 | 19.0 | 17.0 | 17.0 | 16.0 | 19.0 | 20.0 | 27.0 | 26.0 | 31.0 | 22.8 | 16.7 | | |
| Elgin 2 | 322348 | 862745 | 20.0 | 31.0 | 22.0 | 20.0 | 21.0 | 16.0 | 21.0 | 17.0 | 17.0 | 24.0 | 26.0 | 26.0 | 21.8 | 15.9 | | |
| Elgin 3 | 322328 | 861206 | 8.0 | 12.0 | 8.0 | 8.0 | 7.0 | 6.0 | 6.0 | 7.0 | 6.0 | 10.0 | 10.0 | 13.0 | 8.4 | 6.1 | | |
| Elgin 4 | 323557 | 826356 | 10.0 | 15.0 | 10.0 | 11.0 | 9.0 | 6.0 | 8.0 | 8.0 | 9.0 | 14.0 | 16.0 | 17.0 | 11.1 | 8.1 | | |
| Elgin 5 | 322233 | 861869 | 15.0 | 18.0 | 16.0 | 15.0 | 11.0 | 10.0 | 9.0 | 12.0 | 13.0 | 17.0 | 21.0 | 20.0 | 14.8 | 10.8 | | |
| Elgin 6 | 322029 | 862832 | 14.0 | 19.0 | 15.0 | 15.0 | 11.0 | 9.0 | 9.0 | 11.0 | 11.0 | 21.0 | 21.0 | 20.0 | 14.7 | 10.7 | | |
| Elgin 7 | 321615 | 862307 | 14.0 | 13.0 | 12.0 | 12.0 | 10.0 | 7.0 | 8.0 | 9.0 | 8.0 | 15.0 | 16.0 | 15.0 | 11.6 | 8.5 | | |
| Elgin 8 | 322492 | 863309 | 15.0 | 15.0 | 12.0 | 9.0 | 6.0 | 8.0 | 7.0 | 11.0 | 11.0 | 14.0 | 19.0 | 19.0 | 12.2 | 8.9 | | |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean: Raw Data | Annual Mean: Annualised and Bias Adjusted (0.73) | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elgin 9 | 321775 | 861115 | 5.0 | 8.0 | 6.0 | 6.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 9.0 | 10.0 | 10.0 | 6.6 | 4.8 | | Where concentrations have been measured as below the limit of detection (<5 µg/m$^3$), these have been assumed to be 5 µg/m$^3$ to adopt a conservative approach. |
| Elgin 10 | 320641 | 862291 | 16.0 | 17.0 | 15.0 | 13.0 | 11.0 | 20.0 | 9.0 | 12.0 | 11.0 | 17.0 | 20.0 | 25.0 | 15.5 | 11.3 | | |
| Elgin 11 | 321447 | 863764 | 21.0 | 17.0 | 21.0 | 18.0 | 16.0 | 14.0 | 13.0 | 17.0 | 16.0 | 22.0 | 25.0 | 25.0 | 18.8 | 13.7 | | |
| Fochabers 1 | 334634 | 858726 | 7.0 | 13.0 | 10.0 | 10.0 | 10.0 | 6.0 | 7.0 | 8.0 | 6.0 | 12.0 | 11.0 | 13.0 | 9.4 | 6.9 | | |
| Buckie 1 | 342562 | 865535 | 10.0 | 13.0 | 10.0 | 12.0 | 10.0 | 8.0 | 8.0 | 9.0 | 8.0 | 10.0 | 13.0 | 14.0 | 10.4 | 7.6 | | |
| Forres | 303726 | 858931 | 10.0 | 12.0 | 11.0 | 9.0 | 8.0 | 7.0 | 7.0 | 8.0 | 8.0 | 13.0 | 14.0 | 15.0 | 10.2 | 7.4 | | |
| Keith 1 | 342592 | 850894 | 16.0 | 22.0 | 21.0 | 20.0 | 18.0 | 14.0 | 15.0 | 16.0 | 15.0 | 22.0 | 22.0 | 23.0 | 18.7 | 13.6 | | |
| Keith 2 | 343329 | 850415 | 18.0 | 22.0 | 21.0 | 20.0 | 18.0 | 14.0 | 14.0 | 17.0 | 15.0 | 21.0 | 21.0 | 20.0 | 18.4 | 13.4 | | |

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean: Raw Data | Annual Mean: Annualised and Bias Adjusted (0.73) | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lossie 1 | 323515 | 870931 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 7.0 | 9.0 | 5.5 | 4.0 | | Where concentrations have been measured as below the limit of detection (<5 µg/m$^3$), these have been assumed to be 5 µg/m$^3$ to adopt a conservative approach. |
| Aberlour 1 | 326571 | 842899 | 16.0 | 16.0 | 14.0 | 12.0 | 10.0 | 8.0 | 9.0 | 11.0 | 11.0 | 16.0 | 16.0 | 14.0 | 12.8 | 9.3 | | |
| Rothes 1 | 327756 | 849658 | 14.0 | 16.0 | 14.0 | 12.0 | 10.0 | 8.0 | 7.0 | 11.0 | 10.0 | 12.0 | 14.0 | 15.0 | 11.9 | 8.7 | | |

☒ **All erroneous data has been removed from the $NO_2$ diffusion tube dataset presented in Table B.1.**

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Moray Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

**Notes:**

Exceedances of the $NO_2$ annual mean objective of 40µg/m$^3$ are shown in **bold**.

$NO_2$ annual means exceeding 60µg/m$^3$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

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

## New or Changed Sources Identified Within Moray Council During 2023

Moray Council has not identified any new sources relating to air quality within the reporting year 2023.

## Additional Air Quality Works Undertaken by Moray Council During 2023

Moray Council has not completed any additional works within the reporting year of 2023.

## QA/QC of Diffusion Tube Monitoring

The $NO_2$ diffusion tubes used by Moray Council in 2023 were prepared and analysed by the Aberdeen Scientific Services Laboratory (ASSL), 20% TEA in water method. The laboratory is United Kingdom Accreditation Service (UKAS) accredited and has good performance in both the LGC Standards Proficiency Testing Scheme (AIR $NO_2$ PT) and National Physical Laboratory (NPL) QA schemes. Monitoring has been completed in adherence with the Diffusion Tube Monitoring Calendar

### Diffusion Tube Annualisation

All diffusion tube monitoring locations within Moray Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

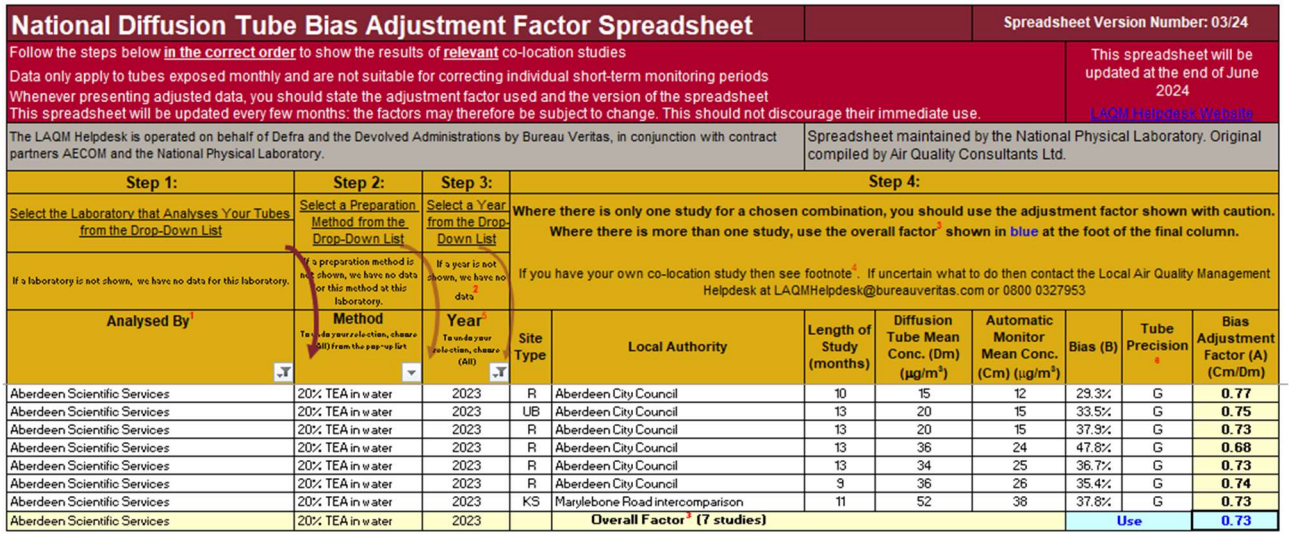
### Diffusion Tube Bias Adjustment Factors

Moray Council have applied a national bias adjustment factor of 0.73 to the 2023 monitoring data. A summary of bias adjustment factors used by Moray Council over the past five years is presented in Table C.1.

The national factor was taken from the latest version of the national spreadsheet, released in March 2024. The factor is applicable to a total of seven studies. The national adjustment factor was chosen as it is not possible to calculate a local adjustment factor due to the absence of co-located monitoring locations.

### Table C.1 – Bias Adjustment Factor

| Year | Local or National | If National, Version of National Spreadsheet | Adjustment Factor |
|---|---|---|---|
| 2023 | National | 03/24 | 0.73 |
| 2022 | National | 03/23 | 0.76 |
| 2021 | National | 09/22 | 0.77 |
| 2020 | National | 09/22 | 0.78 |
| 2019 | National | 03/20 | 0.81 |



**National Diffusion Tube Bias Adjustment Factor Spreadsheet** — Spreadsheet Version Number: 03/24

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2024
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

**Step 1:** Select the Laboratory that Analyses Your Tubes from the Drop-Down List
If a laboratory is not shown, we have no data for this laboratory.

**Step 2:** Select a Preparation Method from the Drop-Down List
If a preparation method is not shown, we have no data for this method at this laboratory.

**Step 3:** Select a Year from the Drop-Down List
If a year is not shown, we have no data[2]

**Step 4:** Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

| Analysed By[1] | Method (To undo your selection, choose (All) from the pop-up list) | Year[3] (To undo your selection, choose (All) from the pop-up list) | Site Type | Local Authority | Length of Study (months) | Diffusion Tube Mean Conc. (Dm) (µg/m³) | Automatic Monitor Mean Conc. (Cm) (µg/m³) | Bias (B) | Tube Precision[4] | Bias Adjustment Factor (A) (Cm/Dm) |
|---|---|---|---|---|---|---|---|---|---|---|
| Aberdeen Scientific Services | 20% TEA in water | 2023 | R | Aberdeen City Council | 10 | 15 | 12 | 29.3% | G | **0.77** |
| Aberdeen Scientific Services | 20% TEA in water | 2023 | UB | Aberdeen City Council | 13 | 20 | 15 | 33.5% | G | **0.75** |
| Aberdeen Scientific Services | 20% TEA in water | 2023 | R | Aberdeen City Council | 13 | 20 | 15 | 37.9% | G | **0.73** |
| Aberdeen Scientific Services | 20% TEA in water | 2023 | R | Aberdeen City Council | 13 | 36 | 24 | 47.8% | G | **0.68** |
| Aberdeen Scientific Services | 20% TEA in water | 2023 | R | Aberdeen City Council | 13 | 34 | 25 | 36.7% | G | **0.73** |
| Aberdeen Scientific Services | 20% TEA in water | 2023 | R | Aberdeen City Council | 9 | 36 | 26 | 35.4% | G | **0.74** |
| Aberdeen Scientific Services | 20% TEA in water | 2023 | KS | Marylebone Road intercomparison | 11 | 52 | 38 | 37.8% | G | **0.73** |
| Aberdeen Scientific Services | 20% TEA in water | 2023 | | **Overall Factor[3] (7 studies)** | | | | **Use** | | **0.73** |

### $NO_2$ Fall-off with Distance from the Road

No diffusion tube $NO_2$ monitoring locations within Moray Council required distance correction during 2023.

# Appendix D: Monitoring Locations Maps

**Figure 1 Diffusion Tube Monitoring Locations (1)**

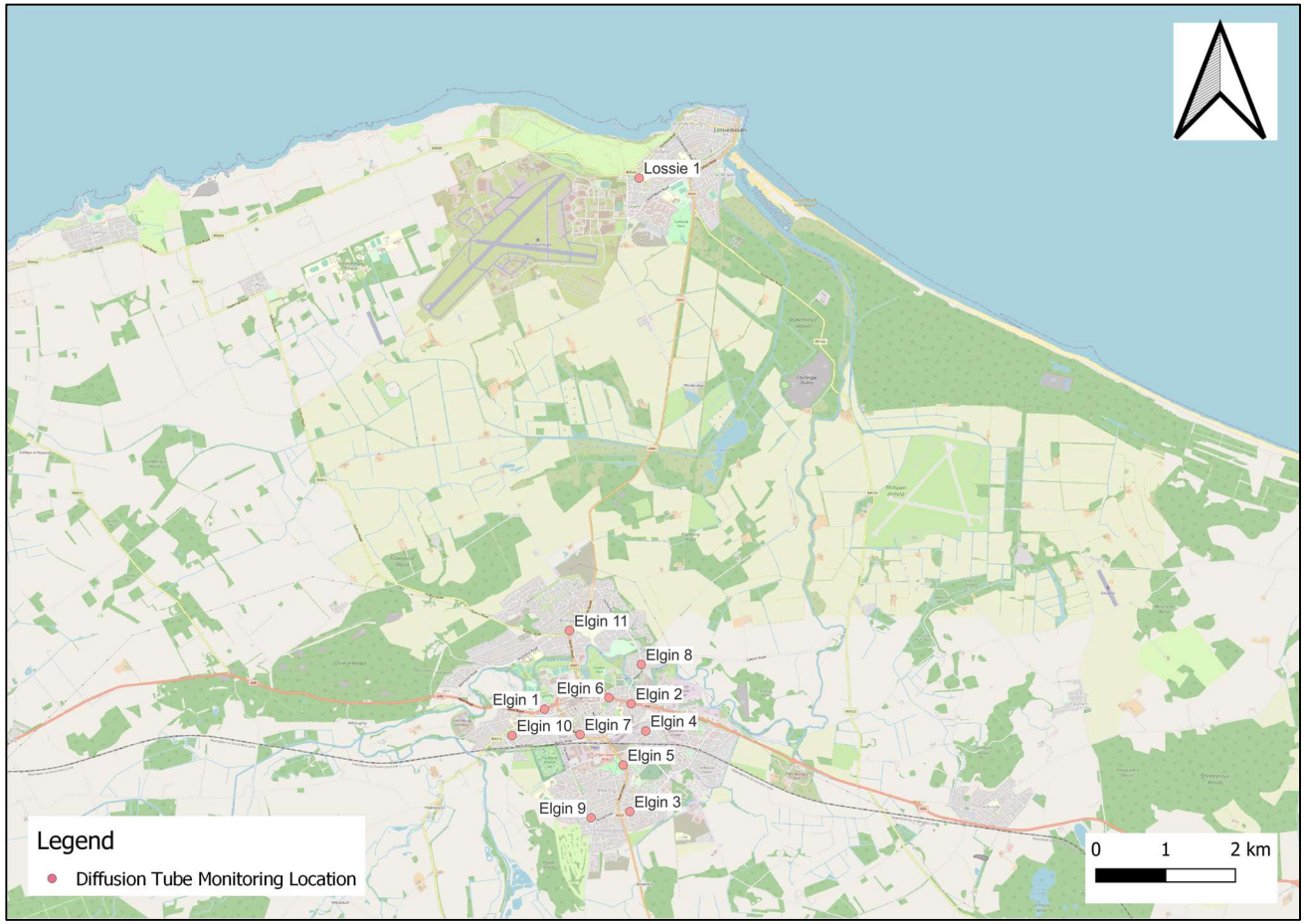


**Figure 2 Diffusion Tube Monitoring Locations (2)**

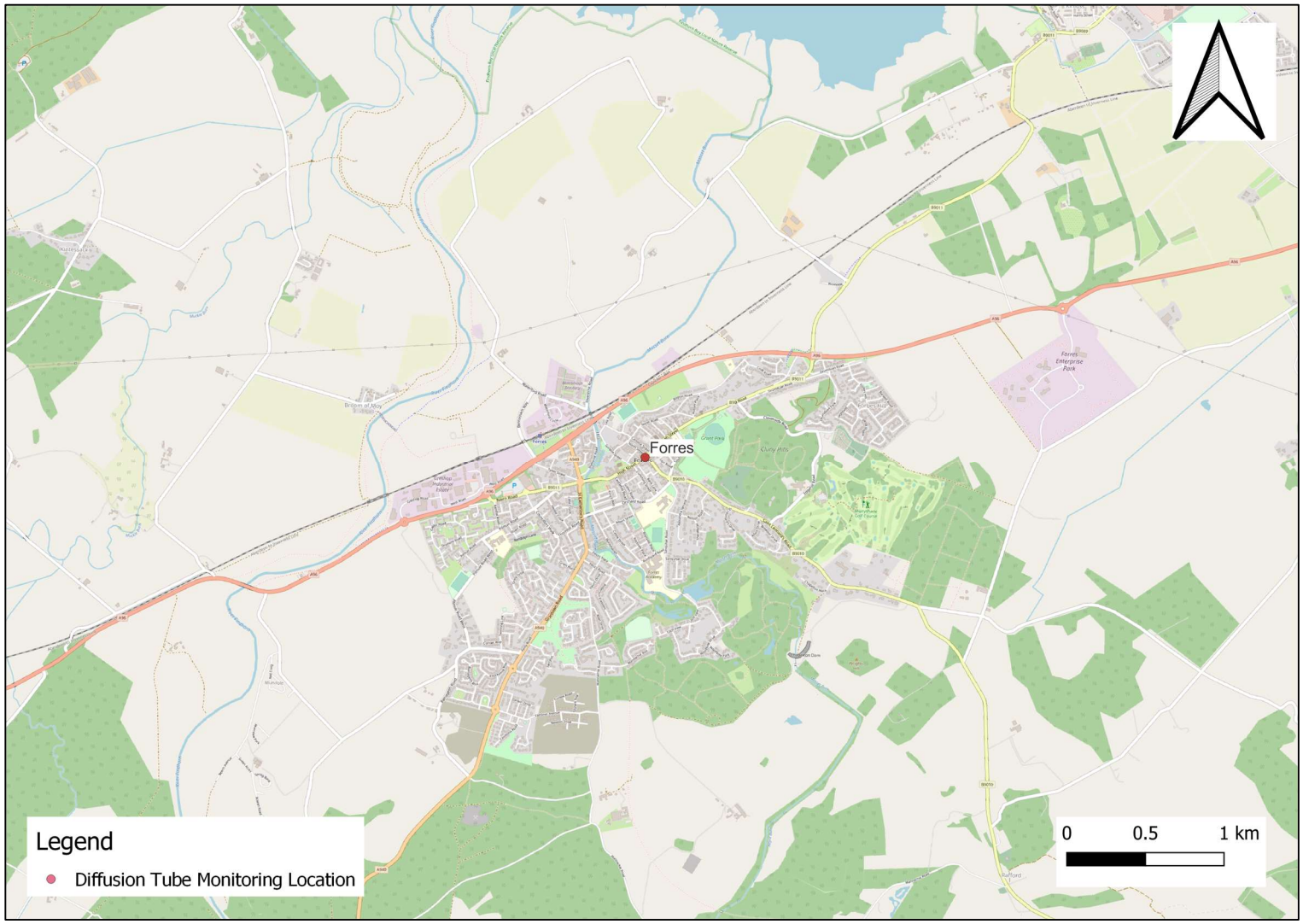
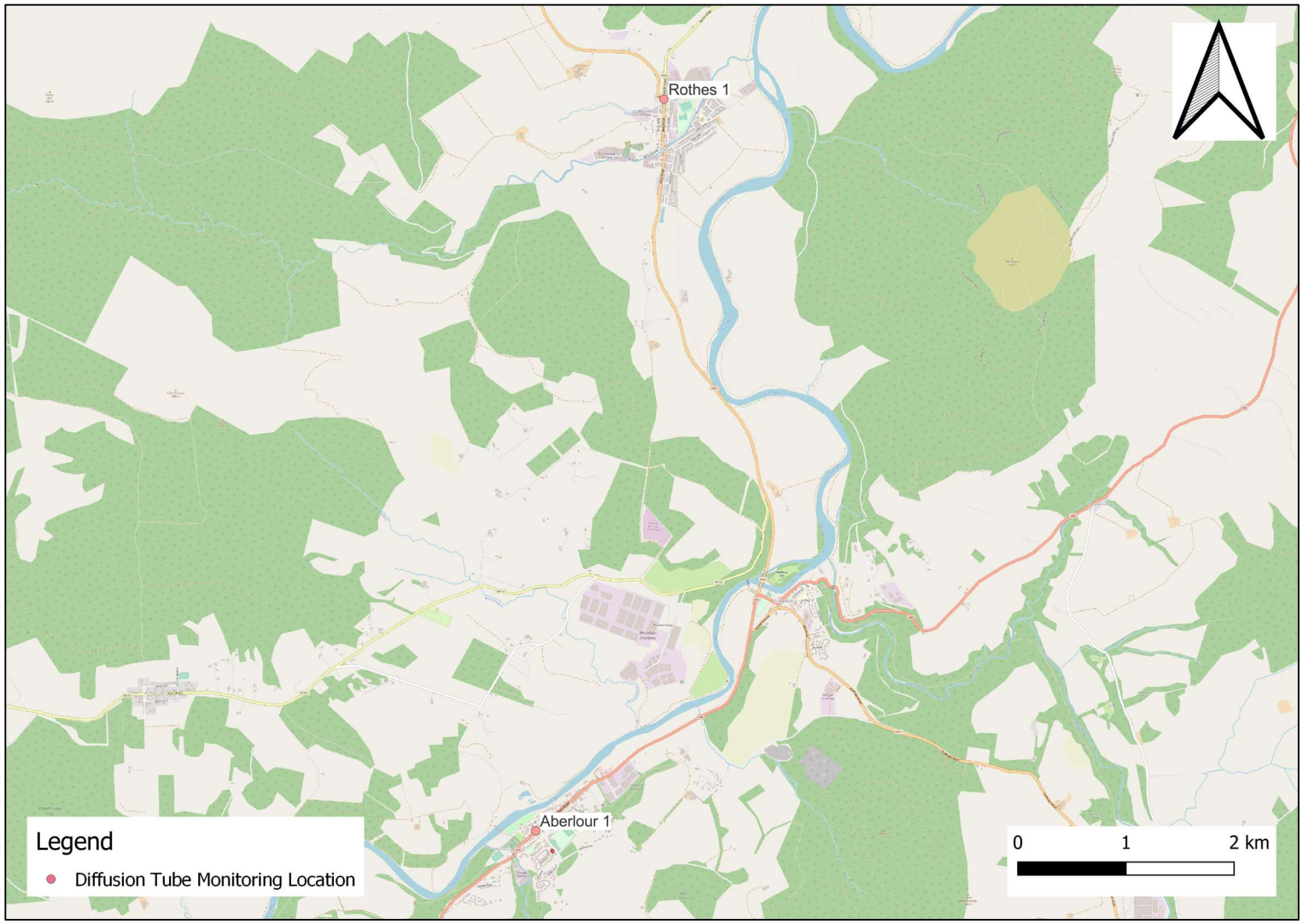


**Figure 3 Diffusion Tube Monitoring Locations (3)**

**Figure 4 Diffusion Tube Monitoring Locations (4)**



# 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 | 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 |
| DT | Diffusion Tube |
| 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. Moray Council (2020) Moray Local Development Plan. Available at: http://www.moray.gov.uk/moray_standard/page_133431.html
2. Moray Council (2022) Active Travel Strategy 2022 -2027. Available at: http://www.moray.gov.uk/moray_standard/page_139797.html
3. Moray Council (2017) Elgin Transport Strategy. Available at: http://www.moray.gov.uk/moray_standard/page_109352.html
4. Moray Council (2011) Second Moray Local Transport Strategy. Available at: http://www.moray.gov.uk/moray_standard/page_75724.html
5. Defra, August 2022, Local Air Quality Management Technical Guidance 2022 (TG.22). Available at: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf