

Annual Progress Report (APR)



2021 and 2022 Air Quality Annual Progress Report (APR) for Moray Council

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

January 2023

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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

There are no existing significant air quality issues identified within the Moray Council administrative area. The Council has examined the 2020 and 2021 air quality monitoring results in its area and concludes that no new Detailed Assessments are required for any pollutant.

Atmospheric nitrogen dioxide (NO₂) 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 2020 and 2021 annual mean concentrations of NO₂ within the Moray Council area remain well below the Air Quality Standards (AQS) set by the Scottish Government. In summary, the following monitoring statistics are observed for each monitoring year:

2020

- A maximum measured annual mean NO₂ concentration of 15.4 µg/m³ was monitored at West Park Court, Elgin (monitoring site DT1), well below the annual mean NO₂ Scottish Air Quality Standard of 40 µg/m³. This was a decrease of approximately 7.3 µg/m³ as compared to the 2019 monitoring results at the same site; and,
- Measured 2020 annual mean NO₂ concentrations show a decrease as compared to the 2019 results at all monitoring locations. This may be due to the start of the COVID-19 pandemic in March 2020.

2021

- A maximum measured annual mean NO₂ concentration of 17.3 µg/m³ was monitored at West Park Court, Elgin (monitoring site DT1), well below the annual

mean NO₂ Scottish Air Quality Standard of 40 µg/m³. This was an increase of approximately 1.9 µg/m³ as compared to the 2020 monitoring results at the same site. It is likely that this increase was due to reductions in restrictions associated with the COVID-19 pandemic; and

- Measured 2021 annual mean NO₂ concentrations show an increase as compared to the 2020 results at 12 out of the 13 monitoring locations. It is likely that this increase was due to reductions in restrictions associated with the COVID-19 pandemic.

All sources of emissions from industry and transport remain unchanged from those reported in the 2020 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. Most notably, the updated Active Travel Strategy aims to build on the increase in walking and cycling.

The Second Moray Local Transport Strategy (2011) 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

The Local Transport Strategy promotes sustainable forms of travel through activities and initiatives including developing new walking and cycling infrastructure, promoting public transport, car sharing, efficient driving techniques and the use of electric vehicles. More information, including cycle routes and electric vehicle charging point locations within the Moray Council area, is available at:

www.moray.gov.uk/moray_standard/page_57100.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 2020 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 2020 and 2021. 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 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 (NO₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM₁₀)	50 µg/m ³ , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m ³	Annual mean	31.12.2010
Particulate Matter (PM_{2.5})	10 µg/m ³	Annual mean	31.12.2021
Sulphur dioxide (SO₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m ³	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m ³	Running 8-Hour mean	31.12.2003

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.

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 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. Moray Council produced a Staff Travel Plan in 2009 which was then updated in 2012 appraising the existing conditions of accessibility to its offices and providing site specific recommendations on how sustainable accessibility might be improved upon (Ref- 1). The Moray Council Active Travel Strategy 2016-2021 highlighted the need for the Staff Travel Plan to be renewed, however this has not been completed at the time of writing.

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. Moray Council produced a draft Climate Change Action Plan in 2011 (Ref- 2). Although not explicitly, the Council had introduced initiatives which would benefit air quality. For example, promoting low carbon vehicles and reducing emissions associated with staff travel and fleet journeys. All new diesel vehicles at that time were Euro V / 5 compliant. Also upgrading of the fleet was being considered to improve overall efficiencies in terms of fuel consumption, emissions and maintenance. Clearly, whilst these initiatives have a reducing effect on carbon and emissions, the impact on air quality would not be as significant.

Moray Council made a Climate Emergency Declaration on 26th June 2019, which included a target to become carbon neutral by 2030. As part of this declaration, it was agreed to consider and approve a final climate change strategy and action plan within six months and to ensure that this plan be adopted and inform policy for all departments, however, as a result of Covid-19, further work on this has been delayed. It is anticipated that measures adopted as part of any approved climate change strategy and action plan developed in response to the Climate Emergency Declaration to achieve the target of carbon neutrality would likely also provide an overall benefit for air quality.

The commitment behind this document, and the initiatives included therein, has been revisited with the development of the North East Scotland Sustainable Energy Action Plan (SEAP) for Moray, Aberdeenshire, Aberdeen City and Angus Councils (Ref- 3).

A SEAP is a high-level strategic document which covers all areas of sustainable energy across business and commercial, domestic and transport including certain aspects of land use and fuel supply. It provides a baseline for the area in terms of carbon emissions and provides an action plan to meet emission reduction targets whilst providing opportunities for sustainable economic growth.

In addition to the North East SEAP there is a Moray specific SEAP which covers the time-period 2015 to 2030. The target within this plan is for Moray to aim to achieve greenhouse gas (GHG) emission reductions of 35% by 2030 compared with the baseline year (2005). For this to be achieved the Council, public and private sector, energy utilities, transport

organisations and the general public will need to take ambitious and meaningful action to reduce energy consumption and resource use and to use cleaner forms of energy to the extent possible.

2.2.3 Further Air Quality Actions

There are no additional actions geared specifically to improving air quality. Actions to promote low carbon futures (as part of the move towards the target of carbon neutrality by 2030) will, however, have a positive effect on reducing emissions of air pollutants across a variety of sources including through:

- Energy efficiency;
- Renewable electricity generation;
- Low-carbon heat;
- Transport; and
- Waste.

Moray Local Development Plan

Moray Council adopted the Moray Local Development Plan 2015 in July 2015 (Ref-4).

This plan provides a single forward planning document that presents a vision and spatial strategy for directing growth in Moray for the next 10-20 years and includes the following two policies that are relevant to air quality:

- Policy EP 8 ‘Pollution’ aims to ensure that new developments do not create pollution which could adversely affect the environment or local amenity. It states that *“Planning applications for developments that may cause significant pollution in term of noise (including RAF aircraft noise), air, water and light emissions will be only approved where detailed assessments report on the levels, character and transmission of the potential pollution is provided by the applicant. The assessment should also demonstrate how the pollution can be appropriately mitigated.”*; and
- Policy EP 12 ‘Air Quality’ aims to protect air quality and seeks to direct sensitive development away from areas of poor air quality and thereby protect human health and the natural environment. It states that *“Development proposals, which, individually or cumulatively, may adversely affect the air quality in an area to a level which could cause harm to human health and wellbeing, or the natural*

environment must be accompanied by appropriate provisions (deemed satisfactory to the Council and Scottish Environment Protection Agency as appropriate) which demonstrate how such impacts will be mitigated.”.

Moray Council Active Travel Strategy

Moray Council adopted the Moray Council Active Travel Strategy 2016-2021 (Ref- 5) in 2017. This strategy 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. Delivery will be through the Council’s own programme of promoting sustainable and active travel and cross departmental work with other areas of the Council in addition to the ongoing partnership approach with external funders, the community and other interested parties. Active travel includes all forms of non-motorised travel i.e., travel that encourages physical activity and so is beneficial to 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.

It should be noted that it is likely that transport-related plans and strategies may be reviewed to take account of any guidance issued in respect of the Covid-19 pandemic.

Elgin Transport Strategy

Moray Council adopted the Elgin Transport Strategy (Ref-7) in August 2017. The strategy:

- Sets out proposals for improvements to the transport network across the city of the next 13 years 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.

Additionally, the Second Moray Local Transport Strategy (MLTS2) (Ref- 7) has been prepared in order to help plan for improved transport infrastructure and services within Moray. MLTS2 has been split into two parts. Part One provides information on the main strategy, outlines the key and secondary objectives together with action plans and information on committed schemes for each of the seven key topics covered including; Active Travel, Public Transport, Ports and Harbours, Roads, Freight Transport, Travel Behaviour and Traffic Management. Part Two summarises the background information, achievements to date, key issues, linkages with other National, Regional and Local policies guidance and also the relationships with other key agencies.

It should be noted that it is likely that transport-related plans and strategies may be reviewed to take account of any guidance issued in respect of the Covid-19 pandemic.

2.3 Progress and Impacts of Measures to address Air Quality in Moray Council

Air Quality within Moray Council is currently considered to be good with monitored concentrations of air pollutants being well below the air quality objectives set by the Scottish Government. Moray Council does not have any declared AQMAs, and therefore has no AQAP or planned actions designed to directly improve local 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

Moray Council did not undertake any automatic (continuous) monitoring during 2020 and 2021.

3.1.2 Non-Automatic Monitoring Sites

Moray Council undertook non-automatic (passive) monitoring of NO₂ at 19 sites during both 2020 and 2021. Table A.1 in Appendix A shows the details of the sites.

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

3.1.3 Other Monitoring Activities

No additional monitoring activities were undertaken by Moray Council in 2020 or 2021.

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 (NO₂)

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

For diffusion tubes, the full 2020 and 2021 datasets of monthly mean values are 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 $60 \mu\text{g}/\text{m}^3$ 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 $60 \mu\text{g}/\text{m}^3$ then the 1-hour mean NO_2 objective is likely to be met in accordance with LAQM.TG(22). There are no monitored NO_2 annual average concentrations of $60 \mu\text{g}/\text{m}^3$ or greater within Moray Council within 2020 and 2021.

Several monitoring periods in both 2020 and 2021 recorded values below the limit of detection (shown as $<5 \mu\text{g}/\text{m}^3$ in Table B.1 in Appendix B. These are likely to be a result of diffusion tubes performance at lower concentrations. Where concentrations have been measured as below the limit of detection, these have been assumed to be $5 \mu\text{g}/\text{m}^3$ to adopt a conservative approach.

2020

Measured NO_2 concentrations at all diffusion tube locations were well below the annual mean objective. The highest NO_2 annual average concentration during 2020 was $15.4 \mu\text{g}/\text{m}^3$ at Elgin 1. As measured concentrations are well below $60 \mu\text{g}/\text{m}^3$, it is considered that there were no exceedences of the 1-hour annual average NO_2 objective during 2020.

Measured annual average NO_2 concentrations across the Moray Council area were lower than 2019 at all locations. The largest decreases were observed at Elgin 1 and Elgin 2 with a decrease in NO_2 concentrations of $7.3 \mu\text{g}/\text{m}^3$. These decreases within Moray Council are likely attributable to the COVID-19 pandemic which caused restrictions to be implemented, which consequently effected transport patterns.

As a result of the COVID-19 pandemic, the LAQM calendar of suggested exposure was not followed during the March and April months. Diffusion tubes deployed during March were exposed for two periods covering March and April, with monitoring continued in accordance with the LAQM exposure calendar from May 2020 onwards. All other exposure periods followed the LAQM exposure calendar.

2021

Measured NO_2 concentrations at all diffusion tube locations were well below the annual mean objective. The highest NO_2 annual average concentration during 2021 was $17.3 \mu\text{g}/\text{m}^3$

at Elgin 1. As measured concentrations are well below $60 \mu\text{g}/\text{m}^3$, it is considered that there were no exceedances of the 1-hour annual average NO_2 objective during 2021.

Measured annual average NO_2 concentrations across the Moray Council area were higher than 2020 at all locations, except Lossie 1. The largest increases was observed at Elgin 6 with an increase in NO_2 concentrations of $2.6 \mu\text{g}/\text{m}^3$. These increases within Moray Council are likely attributable to the ongoing COVID-19 pandemic which caused restrictions to be implemented and lifted, which consequently effected transport patterns.

During 2021, 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. A review of data available from the urban background (UB) Automatic Urban and Rural Network (AURN) in Aberdeen indicates that the PM_{10} concentrations within the Moray Council area of jurisdiction are likely to be low. The average of PM_{10} data available at the Aberdeen AURN UB site during 2021 was $9.5 \mu\text{g}/\text{m}^3$, which is well below the AQS(S) objective set out in Table 1.1. It should be noted that 2021 data was only available from 1st October 2021 and no data was available for 2020 due to the AURN site relocation.

3.2.3 Particulate Matter ($\text{PM}_{2.5}$)

Moray Council did not undertake $\text{PM}_{2.5}$ monitoring during 2020 or 2021 and has no current future plans to undertake such. It is not anticipated that $\text{PM}_{2.5}$ concentrations within Moray Council exceed the relative air quality objective.

A review of the available AURN monitoring data at the Aberdeen UB site during 2021 showed an average $\text{PM}_{2.5}$ concentration of $4.5 \mu\text{g}/\text{m}^3$, which is well below the AQS(S) objective set out in Table 1.1. It should be noted that 2021 data was only available from 1st October 2021 and no data was available for 2020 due to the AURN site relocation.

3.2.4 Sulphur Dioxide (SO₂)

Sulphur dioxide is not monitored within the Moray Council area. It is not expected that existing SO₂ emissions will cause SO₂ 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 2020 and 2021.

4.2 Other Transport Sources

There have been no planning applications for local developments of other transport sources in 2020 and 2021.

4.3 Industrial Sources

There have been no planning applications for local developments of industrial sources in 2020 and 2021.

4.4 Commercial and Domestic Sources

There have been no planning applications for local developments of commercial and domestic sources in 2020.

In 2021, two applications for commercial and domestic sources were submitted in Moray Council. These applications are still pending. The information for these sources is outlined in Table 4.1.

Table 4.1 – New Commercial and Domestic Sources in the Moray Council Administrative Area in 2021

Year	Planning Reference	Proposal	Decision
2021	21/01901/EIA	Proposed 100,000 tonnes per annum malt producing facility on Land at Greens of Rothes Moray	Pending
2021	21/01904/EIA	Heat and Power and connection between Rothes CoRDE and proposed maltings on Land at Greens of Rothes Moray	Pending

4.5 New Developments with Fugitive or Uncontrolled Sources

There have been no planning applications for local developments of commercial and domestic sources in 2020.

In 2021, one application for new developments with fugitive or uncontrolled sources was permitted in Moray Council. The information for this source is outlined in Table 4.2.

Table 4.2 – New Developments with Fugitive or Uncontrolled Sources in the Moray Council Administrative Area in 2021

Year	Planning Reference	Proposal	Decision
2021	21/01615/EIA	South Western Extension of Cobble and Sand Quarry at Lossie Forest Quarry Moray	Permitted

5 Planning Applications

There were no known planning applications during 2020 and 2021 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 NO₂ monitoring across the Moray Council area during both 2020 and 2021 confirm that there are no exceedances of the annual average NO₂ objectives. Available monitoring data from 2016 to 2020 shows an overall stable, decreasing trend in NO₂ concentrations. During 2020, NO₂ concentrations decreased at all monitoring locations relative to the 2019 data. This decrease is larger than previous years which is likely due to the COVID-19 pandemic, which added restrictions from March 2020 and in response road transport across the area decreased. During 2021, the monitoring data shows an increase in annual average NO₂ concentrations at 18 of 19 monitoring locations. This is likely due to the reductions in COVID-19 restrictions across the Moray Council area. The 2021 NO₂ monitoring results were less than or similar to the concentrations monitored at all locations during 2019 which suggests that pollutant concentrations are still following a stable and decreasing trend.

6.2 Conclusions relating to New Local Developments

One new source was permitted within 2021 (a quarry extension), whilst two other applications are still pending. It is not considered likely that this new source would have potential to result in any exceedances of the air quality objectives within the Moray Council administrative area.

6.3 Proposed Actions

The monitoring data for both 2020 and 2021 do not identify any exceedances of the NO₂ objectives within the Moray administrative area. There are no other exceedances for other pollutants expected within the Moray administrative area within 2020 and 2021.

Monitored concentrations of NO₂ within the Moray Council administrative area have generally decreased year on year since 2018. 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	N	<5	1.0	No	3.0
Elgin 2	Elgin 2	Kerbside	322348	862745	NO ₂	N	<2	1.0	No	3.0
Elgin 3	Elgin 3	Roadside	322328	861206	NO ₂	N	<22	6.0	No	3.0
Elgin 4	Elgin 4	Roadside	322557	826356	NO ₂	N	<18	3.0	No	3.0
Elgin 5	Elgin 5	Kerbside	322233	861869	NO ₂	N	<5	1.0	No	3.0
Elgin 6	Elgin 6	Kerbside	322029	862832	NO ₂	N	<5	1.0	No	3.0
Elgin 7	Elgin 7	Roadside	321615	862307	NO ₂	N	<5	1.0	No	3.0
Elgin 8	Elgin 8	Roadside	322492	863309	NO ₂	N	<5	2.0	No	3.0
Elgin 9	Elgin 9	Kerbside	321775	861115	NO ₂	N	5.0	2.0	No	3.0
Elgin 10	Elgin 10	Kerbside	320641	862291	NO ₂	N	5.0	1.0	No	3.0
Elgin 11	Elgin 11	Roadside	321463	863794	NO ₂	N	<21	5.0	No	3.0
Fochabers 1	Fochabers 1	Kerbside	334634	858726	NO ₂	N	<2	2.0	No	3.0
Buckie 1	Buckie 1	Roadside	342562	865535	NO ₂	N	0	5.0	No	3.0
Forres	Forres	Urban Background	303726	858931	NO ₂	N	<2	n/a	No	3.0
Keith 1	Keith 1	Roadside	342592	850894	NO ₂	N	0	6.0	No	3.0
Keith 2	Keith 2	Kerbside	343329	850415	NO ₂	N	<5	2.0	No	3.0
Lossie 1	Lossie 1	Kerbside	322463	870293	NO ₂	N	<5	2.0	No	3.0
Aberlour 1	Aberlour 1	Roadside	326571	842899	NO ₂	N	<3	4.0	No	3.0
Rothies 1	Rothies 1	Kerbside	327756	849658	NO ₂	N	<5	2.0	No	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 2020 NO₂ Monitoring Results (µg/m³)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
Elgin 1	Kerbside	Diffusion Tube	98.4	98.4	22.9	20.7	21.7	22.7	15.4
Elgin 2	Kerbside	Diffusion Tube	98.4	98.4	23.3	23.0	24.4	22.2	14.9
Elgin 3	Roadside	Diffusion Tube	56.0	56.0	n/a	n/a	n/a	11.4	6.0
Elgin 4	Roadside	Diffusion Tube	98.4	98.4	n/a	n/a	n/a	10.1	7.1
Elgin 5	Kerbside	Diffusion Tube	98.4	98.4	17.9	15.7	17.2	16.0	10.4
Elgin 6	Kerbside	Diffusion Tube	98.4	98.4	17.5	15.7	17.2	16.0	9.8
Elgin 7	Roadside	Diffusion Tube	98.4	98.4	10.0	9.9	11.4	9.8	7.0
Elgin 8	Roadside	Diffusion Tube	98.4	98.4	14.3	13.5	13.4	11.3	9.4
Elgin 9	Kerbside	Diffusion Tube	98.4	98.4	7.9	6.9	7.6	7.3	5.2
Elgin 10	Kerbside	Diffusion Tube	98.4	98.4	15.1	13.0	13.6	12.7	9.5
Elgin 11	Roadside	Diffusion Tube	98.4	98.4	n/a	n/a	n/a	18.1	13.7
Fochabers 1	Kerbside	Diffusion Tube	98.4	98.4	11.6	9.9	11.0	8.5	6.1
Buckie 1	Roadside	Diffusion Tube	88.7	88.7	n/a	n/a	n/a	9.5	7.4
Forres	Urban Background	Diffusion Tube	92.0	92.0	13.9	12.7	12.4	10.9	7.4
Keith 1	Roadside	Diffusion Tube	81.0	81.0	n/a	n/a	n/a	18.7	12.7
Keith 2	Kerbside	Diffusion Tube	98.4	98.4	25.7	21.3	24.2	17.6	12.4
Lossie 1	Kerbside	Diffusion Tube	98.4	98.4	5.9	5.1	5.9	5.4	4.5
Aberlour 1	Roadside	Diffusion Tube	98.4	98.4	n/a	n/a	n/a	13.1	8.1
Rothies 1	Kerbside	Diffusion Tube	98.4	98.4	16.8	14.6	14.0	12.5	9.1

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in bold.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 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%).

Table A.3 – Annual Mean 2021 NO₂ Monitoring Results (µg/m³)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
Elgin 1	Kerbside	Diffusion Tube	99.7	99.7	20.7	21.7	22.7	15.4	17.3
Elgin 2	Kerbside	Diffusion Tube	99.7	99.7	23.0	24.4	22.2	14.9	16.2
Elgin 3	Roadside	Diffusion Tube	99.7	99.7	n/a	n/a	11.4	6.0	6.4
Elgin 4	Roadside	Diffusion Tube	99.7	99.7	n/a	n/a	10.1	7.1	8.1
Elgin 5	Kerbside	Diffusion Tube	99.7	99.7	15.7	17.2	16.0	10.4	10.9
Elgin 6	Kerbside	Diffusion Tube	99.7	99.7	15.7	17.2	16.0	9.8	12.4
Elgin 7	Roadside	Diffusion Tube	99.7	99.7	9.9	11.4	9.8	7.0	8.8
Elgin 8	Roadside	Diffusion Tube	99.7	99.7	13.5	13.4	11.3	9.4	9.8
Elgin 9	Kerbside	Diffusion Tube	99.7	99.7	6.9	7.6	7.3	5.2	7.6
Elgin 10	Kerbside	Diffusion Tube	99.7	99.7	13.0	13.6	12.7	9.5	10.7
Elgin 11	Roadside	Diffusion Tube	91.9	91.9	n/a	n/a	18.1	13.7	13.7
Fochabers 1	Kerbside	Diffusion Tube	99.7	99.7	9.9	11.0	8.5	6.1	6.7
Buckie 1	Roadside	Diffusion Tube	91.9	91.9	n/a	n/a	9.5	7.4	8.0
Forres	Urban Background	Diffusion Tube	99.7	99.7	12.7	12.4	10.9	7.4	8.7
Keith 1	Roadside	Diffusion Tube	99.7	99.7	n/a	n/a	18.7	12.7	14.6
Keith 2	Kerbside	Diffusion Tube	99.7	99.7	21.3	24.2	17.6	12.4	13.5
Lossie 1	Kerbside	Diffusion Tube	99.7	99.7	5.1	5.9	5.4	4.5	4.4
Aberlour 1	Roadside	Diffusion Tube	99.7	99.7	n/a	n/a	13.1	8.1	9.1
Rothies 1	Kerbside	Diffusion Tube	99.7	99.7	14.6	14.0	12.5	9.1	10.5

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in bold.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 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.

- (3) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (4) 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 2020 and 2021

Table B.1 – NO₂ 2020 Monthly Diffusion Tube Results (µg/m³)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted ⁽¹⁾
Elgin 1	29	25	14	11	13	13	19	22	26	29	25	29	20.5	15.4
Elgin 2	22	18	13	14	16	18	20	26	27	24	20	22	19.8	14.9
Elgin 3	no data	no data	no data	no data	6	<5	7	10	11	10	9	no data	8.3	6.0
Elgin 4	13	8	7	8	6	7	8	11	13	11	10	13	9.3	7.1
Elgin 5	16	15	10	8	9	8	11	17	19	20	19	16	13.8	10.4
Elgin 6	19	15	8	8	7	8	11	14	18	19	18	19	13.2	9.8
Elgin 7	9	5	7	7	7	7	9	12	14	12	12	9	9.2	7.0
Elgin 8	17	15	7	6	7	8	9	13	17	22	19	17	12.7	9.4
Elgin 9	8	6	<5	<5	<5	<5	5	7	10	10	9	8	6.8	5.2
Elgin 10	14	13	8	7	8	9	10	14	19	20	18	14	12.7	9.5
Elgin 11	24	23	11	9	10	21	14	20	24	23	25	24	18.5	13.7
Fochabers 1	8	5	<5	7	6	7	8	10	12	9	12	8	8.1	6.1
Buckie 1	12	11	<5	no data	7	7	9	12	11	14	13	12	10.1	7.4
Forres	11	9	<5	6	5	5	8	no data	19	15	16	11	9.9	7.4
Keith 1	18	16	no data	11	12	12	15	22	25	19	13	18	16.3	12.7
Keith 2	18	16	7	11	13	14	16	22	23	24	22	18	16.9	12.4
Lossie 1	6	5	<5	<5	<5	<5	<5	<5	9	7	7	6	5.8	4.5
Aberlour 1	15	10	5	6	7	8	10	12	17	17	14	15	11.0	8.1
Rothies 1	<5	14	6	10	9	10	13	16	17	19	16	<5	12.3	9.1

Notes:

(1) See Appendix C for details on bias adjustment

Table B.2 – NO₂ 2021 Monthly Diffusion Tube Results (µg/m³)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted ⁽¹⁾
Elgin 1	38	20	16	20	18	16	16	18	21	24	32	30	22.4	17.3
Elgin 2	27	14	16	24	20	17	22	24	20	22	22	25	21.1	16.2
Elgin 3	9	15	6	9	8	6	5	8	7	9	9	9	8.3	6.4
Elgin 4	17	16	8	12	9	6	9	6	8	11	12	12	10.5	8.1
Elgin 5	21	14	9	12	14	9	11	6	20	16	16	22	14.2	10.9
Elgin 6	21	39	9	13	12	10	11	16	<5	23	15	19	16.1	12.4
Elgin 7	16	23	7	11	10	7	10	9	9	10	11	14	11.4	8.8
Elgin 8	19	20	9	9	7	6	7	7	13	18	16	21	12.7	9.8
Elgin 9	10	39	<5	7	6	9	<5	6	7	6	8	10	9.8	7.6
Elgin 10	21	16	9	13	11	10	10	13	14	14	17	19	13.9	10.7
Elgin 11	29	22	11	14	no data	11	11	14	17	20	20	26	17.7	13.7
Fochabers 1	13	11	7	10	10	8	9	<5	7	6	9	9	8.7	6.7
Buckie 1	12	12	no data	10	9	7	8	11	9	10	13	13	10.4	8.0
Forres	22	12	6	8	9	7	8	8	15	11	14	15	11.3	8.7
Keith 1	25	22	10	20	20	18	21	19	18	16	17	21	18.9	14.6
Keith 2	18	22	12	16	17	14	16	18	18	20	18	22	17.6	13.5
Lossie 1	7	6	<5	<5	<5	<5	<5	<5	<5	<5	6	9	5.7	4.4
Aberlour 1	19	15	10	12	11	8	9	11	12	14	5	16	11.8	9.1
Roths 1	18	16	12	10	14	10	10	13	15	16	16	13	13.6	10.5

Notes:

(1) See Appendix C for details on bias adjustment

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

New or Changed Sources Identified Within Moray Council During 2020 and 2021

Moray Council has not identified any new sources relating to air quality within the reporting years of 2020 and 2021.

Additional Air Quality Works Undertaken by Moray Council During 2020 and 2021

Moray Council has not completed any additional works within the reporting years of 2020 and 2021.

QA/QC of Diffusion Tube Monitoring

The NO₂ diffusion tubes used by Moray Council in both 2020 and 2021 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 NO₂ PT) and National Physical Laboratory (NPL) QA schemes.

During 2020, due to the COVID-19 pandemic, diffusion tubes deployed in the March 2020 period were exposed for two periods. The diffusion tubes were collected during the May period and the diffusion tube monitoring calendar was subsequently followed for the rest of the duration of 2020. In 2021, the diffusion tube monitoring calendar was followed.

Diffusion Tube Annualisation

In 2020, diffusion tube monitoring location Elgin 3 required annualisation. An annualisation factor of 0.9334 was applied to this data. The annualization factor was calculated from data at AURN sites Dundee Mains Loan and Fort William.

All other diffusion tube monitoring locations within Moray Council during 2020 and all diffusion tubes during 2021 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

No automatic monitoring is undertaken by Moray Council; therefore, a national bias adjustment factor has been applied to the monitoring data. Moray Council have applied a national bias adjustment factor of 0.78 to the 2020 monitoring data. Moray Council have applied a national bias adjustment factor of 0.77 to the 2021 monitoring data.

A summary of bias adjustment factors used by Moray Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	09/22	0.77
2020	National	09/22	0.78
2019	National	03/20	0.81
2018	National	03/19	0.81
2017	National	03/18	0.78

NO₂ Fall-off with Distance from the Road

No diffusion tube NO₂ monitoring locations within Moray Council required distance correction during both 2020 and 2021.

Table C.2 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Dundee Mains Loan	Annualisation Factor Fort William	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
Elgin 3	0.9531	0.9138	0.9334	8.3	7.7

Figure 1 Diffusion Tube Monitoring Locations (1)

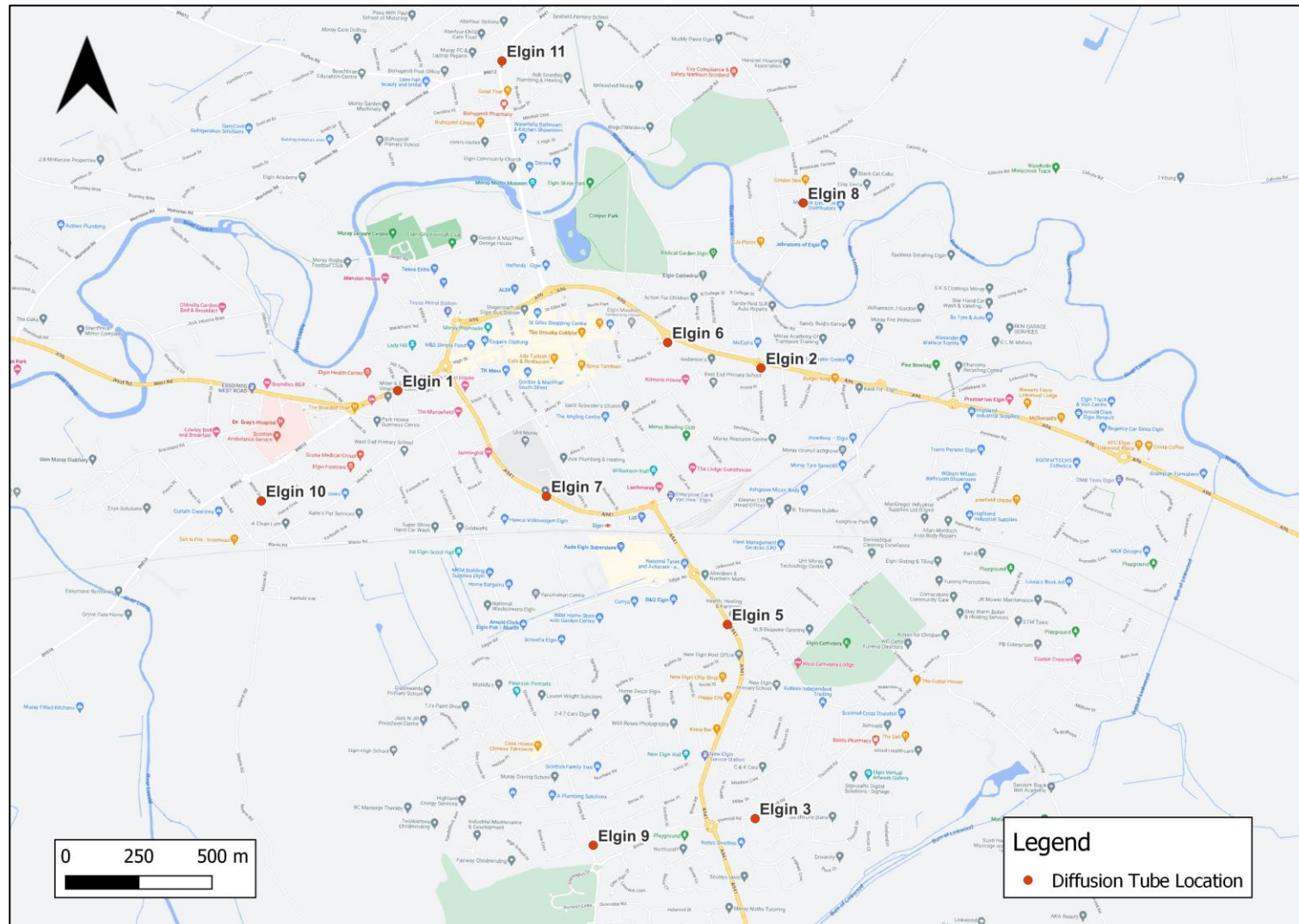


Figure 3 Diffusion Tube Monitoring Locations (3)

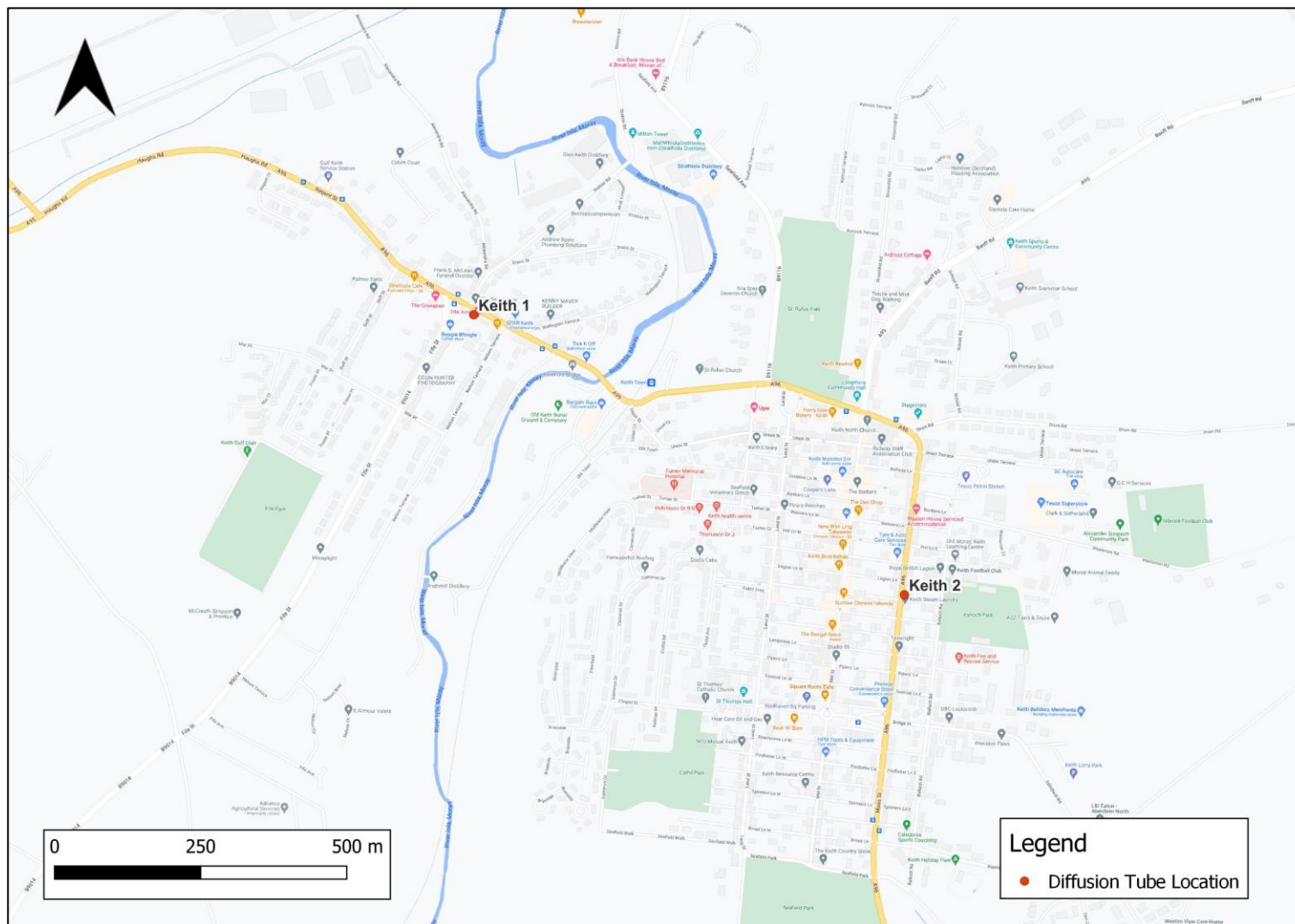


Figure 4 Diffusion Tube Monitoring Locations (4)

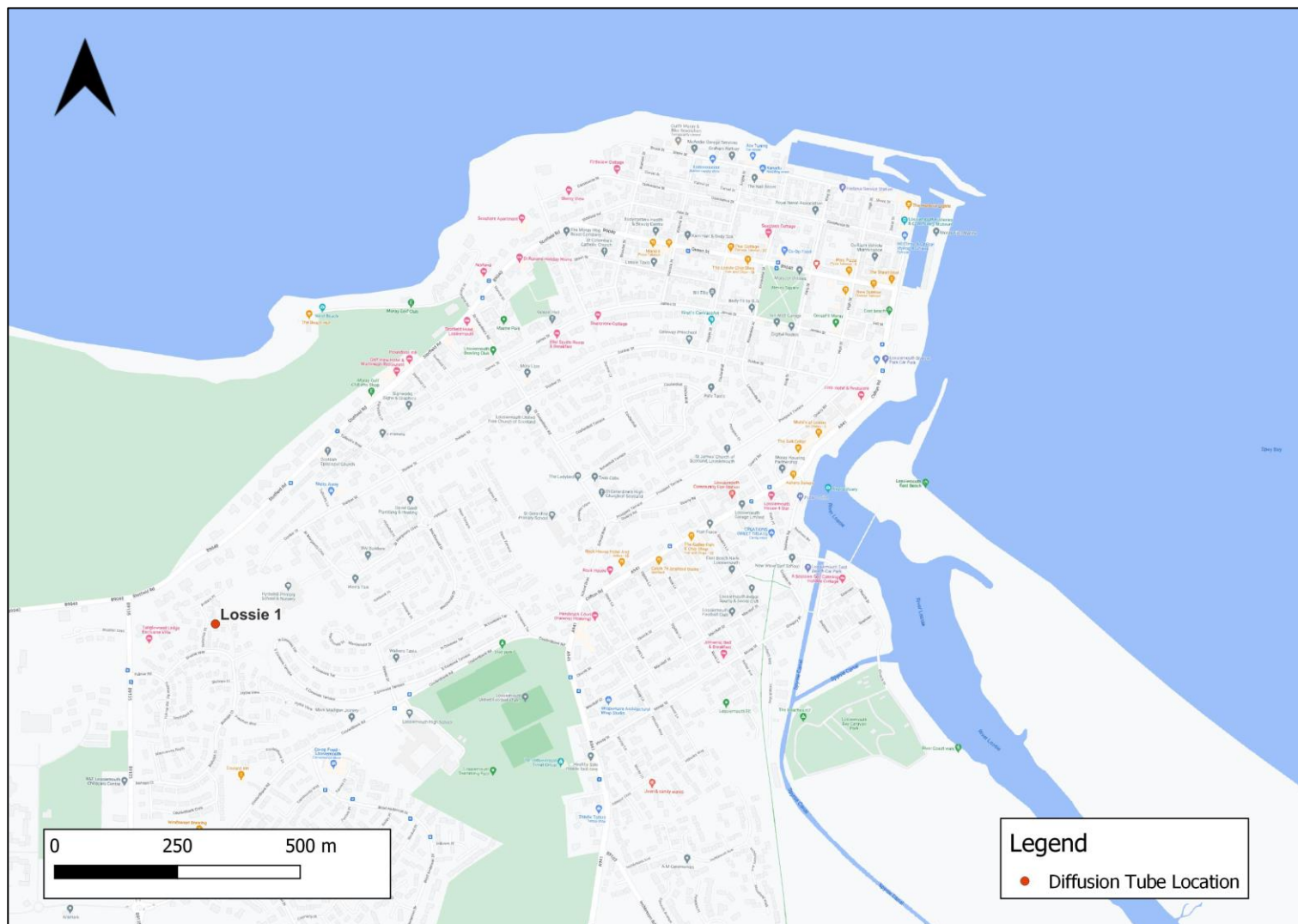


Figure 5 Diffusion Tube Monitoring Locations (5)

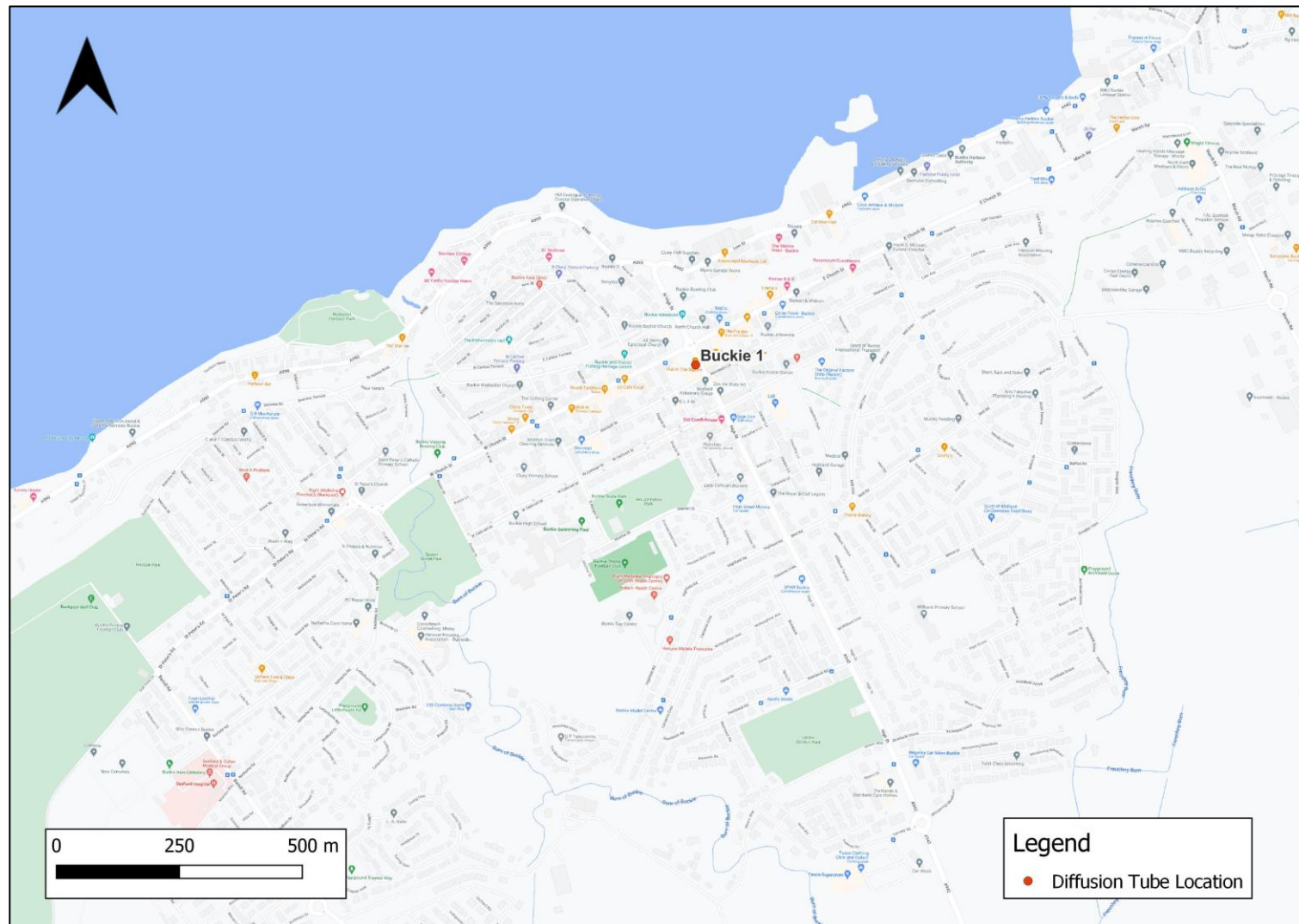


Figure 6 Diffusion Tube Monitoring Locations (6)

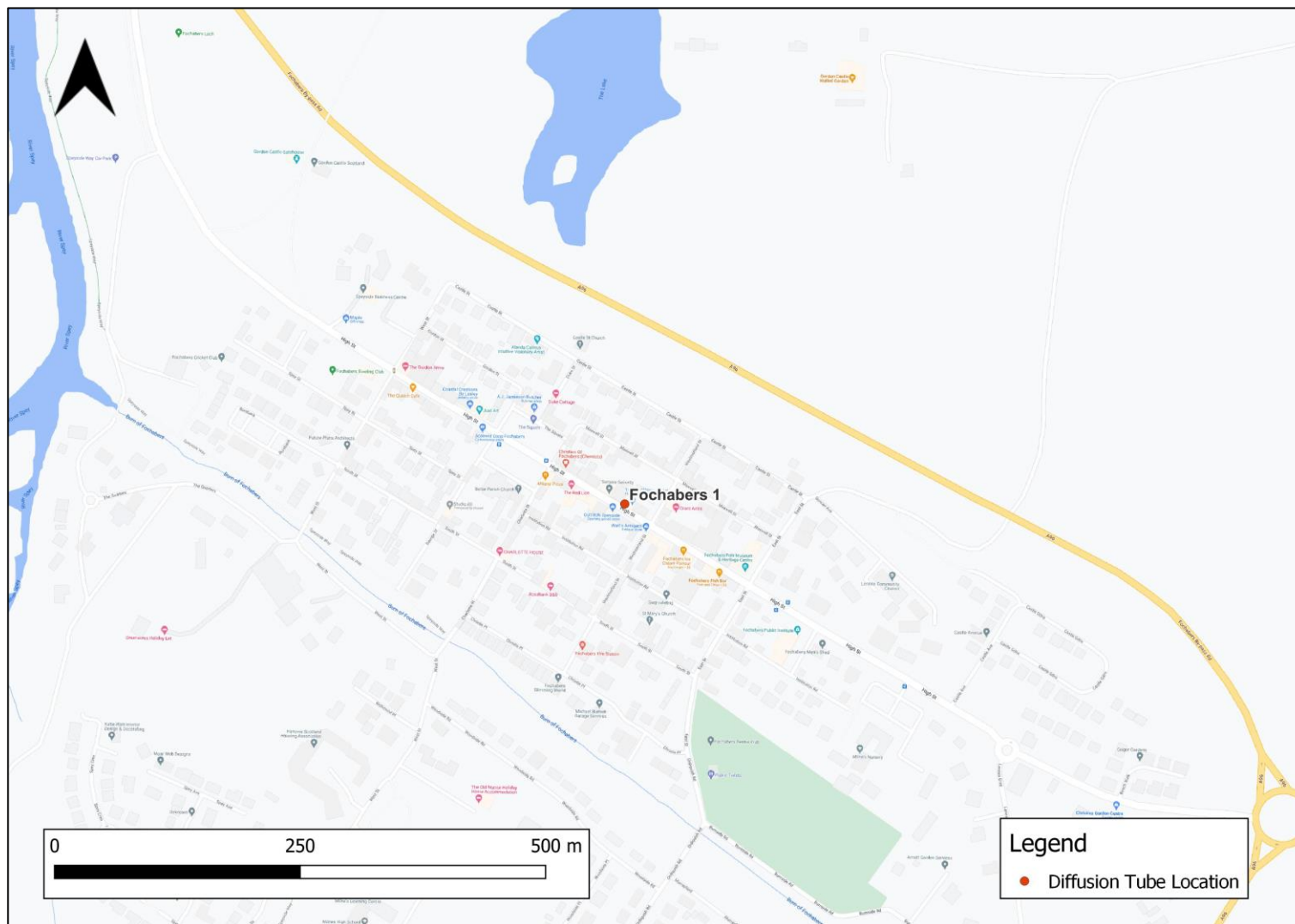


Figure 7 Diffusion Tube Monitoring Locations (7)

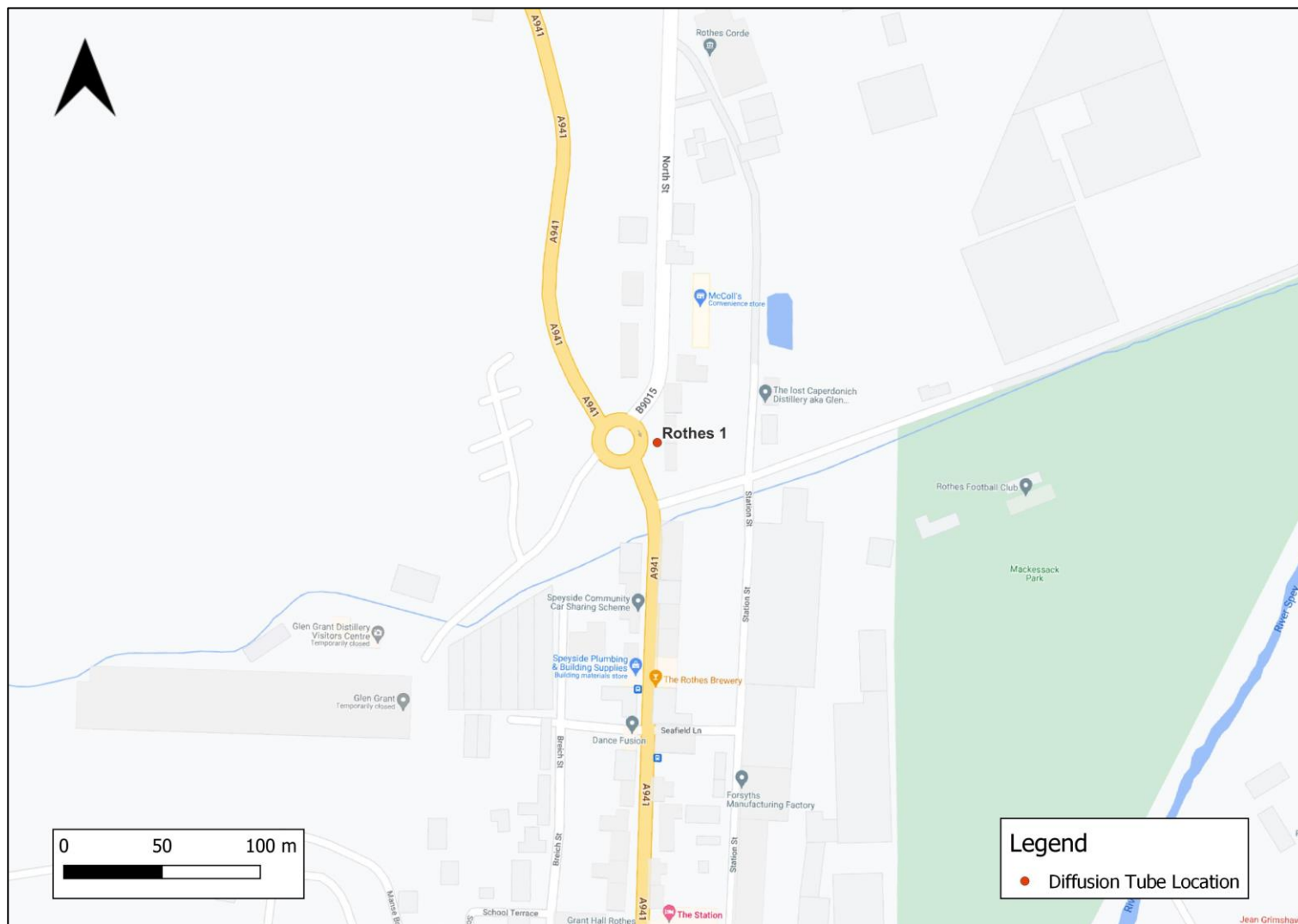
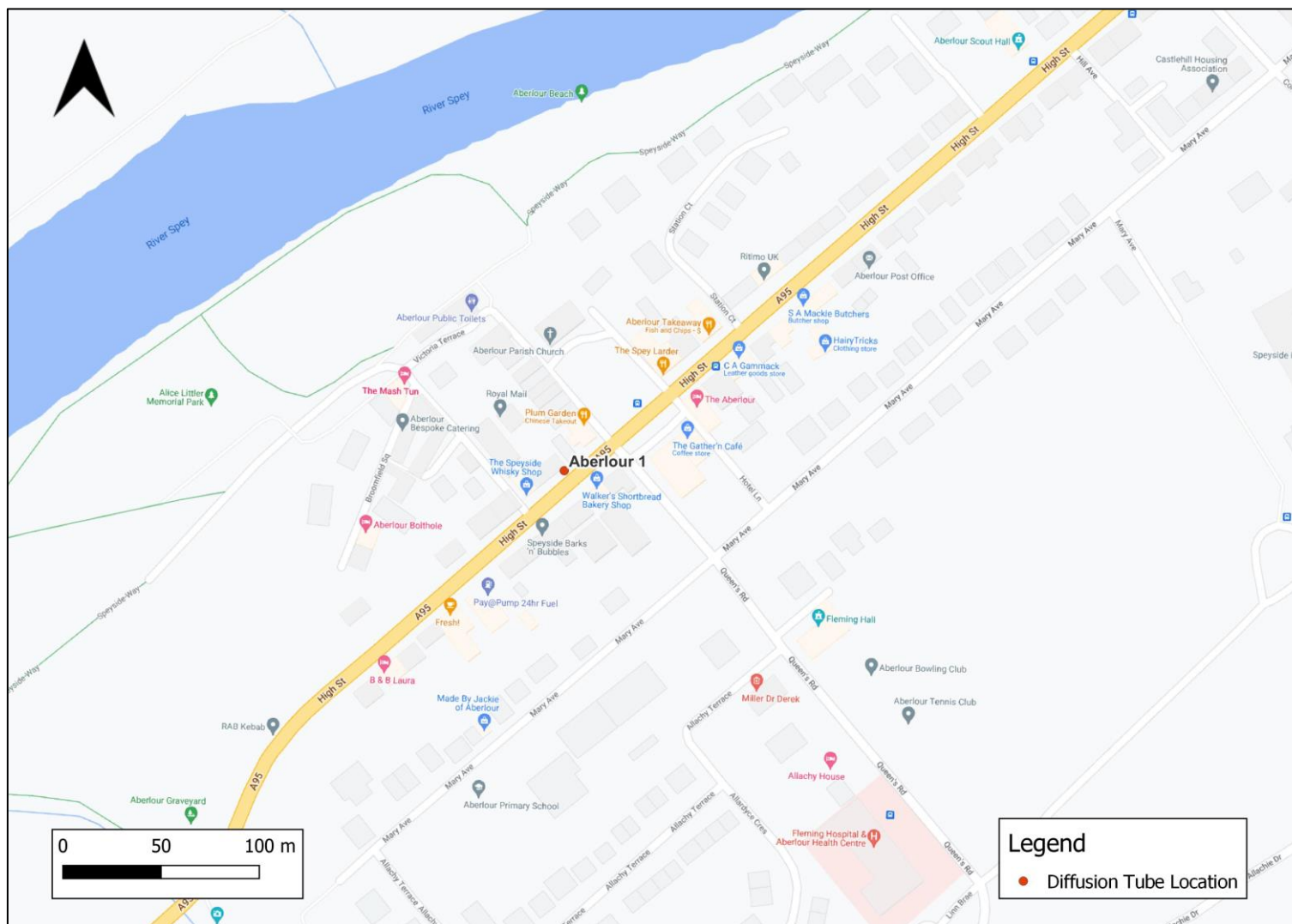


Figure 8 Diffusion Tube Monitoring Locations (8)



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
AQS(S)	Air Quality Strategy Objective (Scotland)
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
UB	Urban Background

References

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