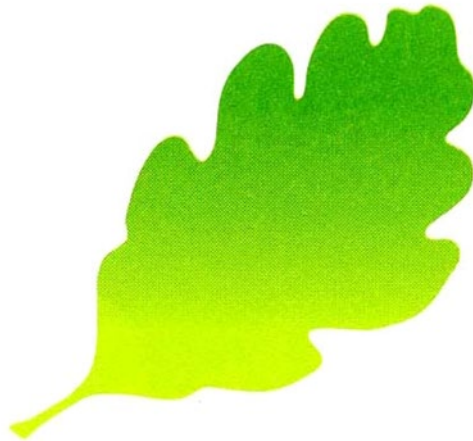


# Annual Progress Report (APR)

Midlothian



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

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

Local Air Quality Management

11 June 2024

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# Executive Summary: Air Quality in Our Area

## Air Quality in Midlothian Council

According to the National Records of Scotland (NRS) Midlothian's population grew by 16.1% between 2011 and 2022, the fastest in Scotland. The area comprises a number of small and medium sized towns, together with many small villages and hamlets.

Penicuik, Bonnyrigg and Dalkeith are the largest towns; Loanhead, Gorebridge, Mayfield, Newtongrange and Pathhead are smaller settlements. A schematic map of Midlothian showing villages, towns and roads within the district is shown in Appendix D, Figure 1. The new town of Shawfair in the North East of Midlothian remains under development and will include approximately 4,000 new homes, schools, commercial and retail use.

Midlothian is largely a countryside setting. The area stretches from the Pentland Hills to the Moorfoots and Lammermuirs, and comprises a gently sloping plain, much of it intensively farmed, rising to moorland with upland country beyond. Much of this landscape is protected by policy designations such as the Green Belt.

There are currently no large industrial processes in very close proximity to housing in Midlothian and the main issues with regards to air quality are due to road traffic emissions, particularly in the town and village centres. Another issue is domestic solid fuel combustion due to the rural setting of Midlothian and limited mains gas supply to some villages. This issue was addressed in the village of Pathhead with the installation of a new gas main.

The report sets out the results of air quality monitoring carried out by Midlothian Council since the Annual Progress Report in 2023 and considers the potential impacts from a range of sources such as road traffic and other transport emissions, industrial processes, commercial and domestic fuel use and fugitive emission sources.

A network of nitrogen dioxide diffusion tubes is maintained throughout the district. The monitoring results indicate that concentrations measured at all locations are well within the annual mean air quality objective.

No new issues were identified in 2023 as requiring further assessment and there are currently no air quality issues identified in Midlothian. It is proposed that our Nitrogen Dioxide tubes sites will be reviewed prior to the next APR in 2025.

## Actions to Improve Air Quality

Some years ago Midlothian Council achieved significant improvements in air quality in Dalkeith and in the village of Pathhead, two areas of previous concern.

The improvement in Pathhead in terms of PM<sub>10</sub>, allowed Midlothian Council to revoke the Pathhead AQMA which was declared in 2008. There are no outstanding Air Quality Managements Areas in Midlothian.

Midlothian Council forms part of East Central Scotland Vehicle Emissions Partnership, together with West Lothian Council, East Lothian Council, Falkirk Council, Stirling Council and Scottish Government. The remit of the Vehicle Emissions Partnership is to help reduce vehicle emissions by encouraging drivers to switch off their engine whenever possible, educating the general public and by handling idling complaints. Further information is available on the partnership website at <http://switchoffandbreathe.org>

Midlothian Council supports and encourages the development of a 'green network' to promote active travel by walking and cycling and which will form part of the Central Scotland Green Network. Further information is available in the Midlothian Council Travel Plan, which is available on Midlothian Council website: [www.midlothian.gov.uk](http://www.midlothian.gov.uk). Midlothian Council is currently updating their travel plan.

Initiatives to move towards a cleaner Council fleet have been in place for several years. Council staff have access to electric cars to use on local business trips, providing an eco-friendly way of travelling. This fleet has recently been increased.

Midlothian Council encourages staff to actively travel to work, promoting a pool bike scheme to staff and promoting interest free loans to purchase a bicycle through the tax free Government 'Bike Purchase Scheme'.

## Local Priorities and Challenges

In terms of local priorities, Midlothian Council is committed to reviewing the diffusion tube locations and implement changes prior to submission of the APR 2025. The last revision was carried out in 2019 and implemented in early 2020. This introduced new NO<sub>2</sub> monitoring locations close to schools and close to new and proposed housing developments.

Midlothian Council continue partnership with Edinburgh Scientific Services for monthly NO<sub>2</sub> tube changes. There are no anticipated challenges for the year ahead in terms of statutory monitoring and reporting requirements.

## How to Get Involved

Information on Local Air Quality Management in Midlothian is available on the Council website at [Air quality | Midlothian Council](#). This information includes copies of the Council's air quality reports and a link to the Pathhead AQMA Revocation Order.

Further information can be obtained by contacting Environmental Health at: [environmentalhealth@midlothian.gov.uk](mailto:environmentalhealth@midlothian.gov.uk)

The website also contains a link to the national Air Quality in Scotland webpage, where members of the public can access historical monitoring data for Midlothian and sign up to receiving text / email alerts where poor air quality is forecast.

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# 1 Local Air Quality Management

This report provides an overview of air quality in Midlothian 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 Midlothian Council to improve air quality and any progress that has been made.

**Table 1.1 – Summary of Air Quality Objectives in Scotland**

<b>Pollutant</b>	<b>Air Quality Objective Concentration</b>	<b>Air Quality Objective Measured as</b>	<b>Date to be Achieved by</b>
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
Nitrogen dioxide (NO <sub>2</sub> )	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
Particulate Matter (PM <sub>10</sub> )	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	31.12.2021
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
Sulphur dioxide (SO <sub>2</sub> )	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO <sub>2</sub> )	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

## 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.

A summary of AQMAs declared by Midlothian Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at [Air quality | Midlothian Council](#).

**Table 2.1 – Declared Air Quality Management Areas**

AQMA Name	Pollutants & Air Quality Objectives	City /Town	Description	Date Declared	Date Revoked
Pathhead AQMA	PM <sub>10</sub> annual mean	Pathhead, Midlothian	An area encompassing 2 square kilometres surrounding the village of Pathhead, Figure 2	30 April 2008	7 April 2014

### 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 Midlothian 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.

Midlothian Council is currently updating their Travel Plan. The update will ensure that air quality is embedded within its objectives.

The current plan, which was originally programmed, to cover the period 2017-2021, is available on the website at [Midlothian Council Travel Plan](#). This plan promotes a reduction in single occupancy car trips (principally those that are part of the daily commute) as well as addressing car parking and car use in general. It also aims to make necessary car travel more sustainable. Travel planning, in line with the ongoing process of organisational change has been influenced by the change in work practices since the Covid-19 pandemic. Midlothian Council, the largest employer in Midlothian, now operates a hybrid working model where staff may work both from home and from offices. This has greatly reduced journeys by staff, linked to commuting. It has also reduced the pressure on car parking around Midlothian's main hubs of Midlothian and Fairfield Houses in the centre of Dalkeith.

At a regional level Midlothian Council is a member of SEStran, one of 7 regional transport partnerships. A key objective of the new SEStran 2035 Regional Transport Strategy is:

*To develop a fully integrated transport system that will be efficient, connected, safe, inclusive, prosperous and sustainable. It must be affordable, accessible to all and deliver the regions contribution to net zero emission targets.*

The Single Midlothian Plan 2023-27 details Midlothian's targets to be healthier, safer, greener, have a wellbeing economy and be better connected. The plan gives the two biggest sources of carbon emissions in Midlothian as domestic uses (30.5%) and transport (27.5%) and aims to concentrate of reducing carbon emissions from these two sources. It is planned to achieve this by, among other actions, more active travel, support for electric vehicles and protection of green spaces.

The current Midlothian Council Local Development plan was produced in 2017. The Council are in the process of preparing Midlothian Local Development Plan 2 (MLDP2). Key issues to be considered within the plan include:

- mitigation and adaptation to the climate emergency and nature/ biodiversity crisis
- the protection and enhancement of natural, historical and cultural assets
- housing land supply to meet housing targets for Midlothian, set out in the Scottish Government's National Planning Framework no.4 (NPF4)
- continuing support for the provision of affordable and specialist housing
- support for economic development, businesses and job creation with an emphasis on community wealth building and a well-being economy
- the provision of infrastructure and services
- support for the rural economy
- support for public transport and active travel
- community building and place making to create great places to live, work, play and invest.

There will be strong engagement throughout the process. The initial consultation stage took place during 2023. Future stages include an open 'call for ideas' from July to October 2024, engagement on a drafted plan from November 2024 to July 2025 and publication of the plan for representation from July to October 2025. MLDP2 will be adopted from December 2026.

NPF4 has a real focus on climate crisis, sustainability and biodiversity including renewable energy, living locally and the 20-minute neighbourhood, location and quality of different types of development.

### **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.

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

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

Midlothian Council has no air quality action plans established within the Local Authority area.

Table 2.2 – 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	Locating development where it can easily access the borders rail and other public transport	Policy guidance and development control	2017 onwards	Ongoing	n/a	To be further considered in Local development plan 2	Ongoing	None identified
2	Vehicle idling	Vehicle idling	2017 onwards	Ongoing	Annual funding via Joint East Central Vehicle Emissions Partnership	All service requests are assessed by East Central Vehicle Emissions Partnership and used to identify any emerging trends	Ongoing	Annual funding reviews
3	<u>Midlothian Council Travel plan &amp; Active Travel Strategy:</u> Promoting active travel, travel alternatives, Vehicle Fleet Efficiency, Promoting Low Emission Transport	Promoting travel alternatives  Vehicle fleet efficiency	Implementation phase 2017-2021	Ongoing	Funded by Switched on Fleets Fund, managed by Energy Saving Trust	As defined in the Active Travel Strategy	4 new EV charging points were installed in 2023. 25 public access EV charging points withing MC area	Midlothian Council Travel Plan is currently being updated

4	<u>Midlothian Hybrid working Policy:</u> Promoting a reduction in work related travel, travel out with peak times.	Promoting travel alternatives	2022 - present	Ongoing	Not funded	Digital service training rolled out to all staff	Ongoing	Variable level of competency within the workforce
5	<u>Midlothian Local Development Plan 2017:</u> Incorporating high speed broadband connections and other digital technologies in new housing developments to facilitate home working and reduction in travel	Alternatives to private vehicle use	2017 onwards	Ongoing	The 2017 plan requires developers to deliver technology infrastructure as part of the development.	New Local Plan (MLDP2) development has begun	Ongoing	None identified
6	<u>Midlothian Local Development Plan 2017:</u> A requirement for cycle parking to be incorporated into the layout of new housing development.	Policy guidance and development control	2017 onwards	Ongoing	Not funded	New Local Plan (MLDP2) development has begun	Ongoing	None identified, will be considered within the MLDP2
7	<u>Midlothian Local Development Plan 2017:</u> The development and extension of the	Promoting travel alternatives	2017 onwards	Ongoing	Application (2023) for funding under the 2024/25 Sustrans Network	New Local Plan (MLDP2) development has begun	Ongoing	None identified

	National Cycle Network (NCN)				Development Fund	Midlothian Council Active Travel Strategy Development  Sustrans undertaking a review of NCN		
8	<u>Midlothian Local Development Plan 2017</u> : Dedicated routes to encourage walking and cycling to work and for recreation and leisure.	Promoting travel alternatives	2017 onwards	Ongoing	Developer contributions.  2022/23 onwards Sustrans “Places for Everyone” programme fund  Application (2023) under the 2024/25 Sustrans Network Development Fund	New Local Plan (MLDP2) development has begun  New Midlothian Active Strategy (“On the Move Midlothian”) under development	Ongoing	None identified



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

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

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

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

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

Midlothian Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 18 sites during 2023. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. 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 other monitoring activities were undertaken 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<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 five years with the air quality objective of 40 µg/m<sup>3</sup>.

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

There are no exceedance of the air quality objective for NO<sub>2</sub> in 2023 or in any year proceeding this.

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

Midlothian Council does not monitor for PM<sub>10</sub>.

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

Midlothian Council does not monitor for PM<sub>2.5</sub>.

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

Midlothian Council does not monitor for SO<sub>2</sub>.

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

Midlothian Council does not monitor for Carbon Monoxide, Lead and 1,3-Butadiene.

## **4 New Local Developments**

There have been no major developments in Midlothian in 2023 which may adversely affect air quality.

### **4.1 Road Traffic Sources**

In Midlothian in 2023 there have been no new changes to road traffic sources which may impact on air quality such as:

- 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.
- Roads with new/changed layout
- Bus or coach stations.

## 4.2 Other Transport Sources

In Midlothian, in 2023, there have been no other changes to major transport source such as:

- 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

There have been no major developments in Midlothian in 2023 which required AQIA or met the criteria of:

- **Industrial installations:** new or proposed installations for which an air quality impact assessment has been carried out.
- **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 impact assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.

## 4.4 Commercial and Domestic Sources

In 2023 work commenced on the Destination Hillend development. This development required an Environmental Impact Assessment of which an Air Quality Impact assessment (AQIA) formed part. This AQIA concluded that the development of Destination Hillend will have negligible impact on air quality in the surrounding area. There have been no developments in 2023 within Midlothian which met the criteria of:

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.

- Combined Heat and Power (CHP) plant.

## 4.5 New Developments with Fugitive or Uncontrolled Sources

There has been no newly constructed/operational:

- Landfill sites
- Quarries
- Unmade haulage roads on industrial sites.
- Waste transfer stations, etc
- Other potential sources of fugitive particulate matter emissions.

within Midlothian Council area in 2023.

## 5 Planning Applications

As the fastest growing Local Authority, Midlothian Council has received a number of planning applications some of which could have an impact on local air quality.

Planning application 23/00595/DPP relates to the formation of a recycling facility and waste transfer station at Middleton Lower Quarry in Gorebridge. Proposals are for the excavation and recycling of previously infilled material at the site and the recycling of newly imported materials. During consultation, Environmental Health expressed concern for likely impact of dust particulate matter on air quality. It was requested that the applicant submits an air quality impact assessment and dust management plan including particulate matter monitoring.

Planning application 24/00338/DPP relates to a mixed use development in Loanhead including Class 1A (shops), Class II (assembly and leisure) and class 4 (business) with associated infrastructure. Environmental Health have been consulted for comment. It is noted that there are two existing NO<sub>2</sub> tube locations within Loanhead with annual mean of 17.8 and 12.7 µg/m<sup>3</sup>, significantly below the statutory objective of 40 µg/m<sup>3</sup>.

Planning application 24/00310/DPP relates to change of use from a scrap yard to waste transfer site in Loanhead. This application was supported by an approved supporting statement with associated dust management plan. For the closest receptors there is a slight potential for adverse effect from dust emissions, but it was not found to be significant. The site will also operate under licence by SEPA under the Waste

Management Licensing (Scotland) Regulations 2011 which will also consider air quality impact.

## **6 Conclusions and Proposed Actions**

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

Nitrogen dioxide levels were monitored at several locations across Midlothian using diffusion tubes. The 2023 results indicated that concentrations measured at all locations were well within the annual mean and short-term air quality objective.

Although a number of non-automatic NO<sub>2</sub> sites show a slight increase from 2022 levels, with the exception of three sites all differences are less than 2µg/m<sup>3</sup>. It should also be taken into account that the 2022 levels were annualised due to less than 75% capture.

In 2023 all passive Diffusion Tubes measured NO<sub>2</sub> below the statutory annual mean objective. The highest reading Diffusion Tube (ND1, Dalkeith) recorded an annual mean of 20.7 µg/m<sup>3</sup> of NO<sub>2</sub> which is well below the statutory objective of 40 µg/m<sup>3</sup>. Similarly to results from 2020-2022, Diffusion Tube sites in 2023 (except marginally one) were showing lower levels than pre COVID-19 in 2019. No NO<sub>2</sub> monitoring sites breached the short-term statutory objective in 2023.

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

As in the last few years, a large number of sites in Midlothian are currently under development for housing, following allocation in the Midlothian Local Development plan. Sites within the wider Shawfair area, which contains the villages of Millerhill, Danderhall and Newton and extending to Cauldcoats Farm, close to the boundary with the City of Edinburgh Council continue to be developed.

### **6.3 Proposed Actions**

The last detailed review of diffusion tube locations took place at the end of 2019. Advice from the appraisal of Midlothian's 2022 Annual Progress Report was to review monitoring locations again. It is planned that that this review, in consultation with SEPA, will take place and any changes in monitoring locations made, prior to submission of the Annual

Progress report in 2025. In the meantime, Midlothian Council will continue to monitor the concentration of NO<sub>2</sub> at the current locations spread throughout the district.

## 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)	Tube co-located with a Continuous Analyser?	Height (m)
SWN	Shawfair	Roadside	330662	670904	NO <sub>2</sub>	N	0	1.5	N	2.2
SWS	Shawfair	Roadside	330309	669685	NO <sub>2</sub>	N	0	1.5	N	2.3
ED1	Dalkeith	Roadside	333206	667372	NO <sub>2</sub>	N	0.1	1.5	N	2.2
ND1	Dalkeith	Roadside	333410	667059	NO <sub>2</sub>	N	2	1.5	N	2.25
DL1	Dalkeith	Roadside	333247	667073	NO <sub>2</sub>	N	0	1.5	N	2.4
BD1	Dalkeith	Roadside	333055	667183	NO <sub>2</sub>	N	0.1	1.5	N	2.3
DDC	Dalkeith	Roadside	334887	667957	NO <sub>2</sub>	N	0	1.5	N	2.15
PD1	Pathhead	Roadside	339601	664172	NO <sub>2</sub>	N	3	1.5	N	2.45
BER	Bonnyrigg	Roadside	331798	665894	NO <sub>2</sub>	N	0	1.5	N	2.45
BCR	Bonnyrigg	Roadside	331424	664808	NO <sub>2</sub>	N	0	1.5	N	2.2
BR1	Bonnyrigg	Roadside	330895	665229	NO <sub>2</sub>	N	0	1.5	N	2.2
LW1	Lasswade	Roadside	330343	666138	NO <sub>2</sub>	N	0	1.5	N	2.15
LW2	Lasswade	Roadside	330470	666125	NO <sub>2</sub>	N	0	0.5	N	2.2
LH1	Loanhead	Roadside	328242	665585	NO <sub>2</sub>	N	2.3	0.9	N	2.2
PGP	Penicuik	Roadside	324824	662115	NO <sub>2</sub>	N	0	1.5	N	2.3
PBH	Penicuik	Roadside	324168	661503	NO <sub>2</sub>	N	0	1.5	N	2.55
P2	Penicuik	Roadside	323677	661000	NO <sub>2</sub>	N	2.5	2.5	N	2.2
SN2	Loanhead	Roadside	327262	666588	NO <sub>2</sub>	N	0	3.6	N	2.3

### 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<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)**

Site ID	Site Type	Monitoring Type	Data Capture for Monitoring Period (%)	Valid Data Capture 2023 (%)	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )				
					2019	2020	2021	2022*	2023
SWN	Roadside	Diffusion Tube	100%	100%	N/C	21.4	18.0	16.6	15.0
SWS	Roadside	Diffusion Tube	100%	100%	17.6	14.3	15.8	7.7	11.6
ED1	Roadside	Diffusion Tube	100%	100%	28.4	21.3	23.1	18.5	19.6
ND1	Roadside	Diffusion Tube	100%	100%	21.7	22.3	21.6	19.5	20.7
DL1	Roadside	Diffusion Tube	100%	100%	17.9	21.5	20.8	16.8	15.9
BD1	Roadside	Diffusion Tube	100%	100%	20.7	19.0	19.5	15.3	15.4
DDC	Roadside	Diffusion Tube	100%	100%	N/C	7.1	6.1	4.5	6.6
PD1	Roadside	Diffusion Tube	100%	100%	15.5	9.2	10.4	7.4	8.7
BER	Roadside	Diffusion Tube	100%	100%	N/C	13.8	8.8	7.7	8.3
BCR	Roadside	Diffusion Tube	100%	100%	N/C	8.1	7.5	6.1	7.6
BR1	Roadside	Diffusion Tube	100%	100%	17.3	17.6	17.4	14.0	16.0
LW1	Roadside	Diffusion Tube	100%	100%	17.9	20.9	16.5	13.6	13.8
LW2	Roadside	Diffusion Tube	100%	100%	31.6	28.0	23.2	19.5	20.0
LH1	Roadside	Diffusion Tube	100%	100%	18.1	17.0	12.6	11.7	12.7
PGP	Roadside	Diffusion Tube	100%	100%	N/C	7.1	6.7	5.3	6.7
PBH	Roadside	Diffusion Tube	100%	100%	N/C	11.6	8.2	7.6	9.5
P2	Roadside	Diffusion Tube	100%	100%	17.6	19.2	14.4	13.2	13.5
SN2	Roadside	Diffusion Tube	100%	100%	22.4	26.5	21.7	19.6	17.8

\* All means have been “annualised” as per LAQM.TG(22) as valid data capture for the full calendar year is less than 75%.



Chart A.1 – Dalkeith Annual Mean NO<sub>2</sub> Monitoring Results

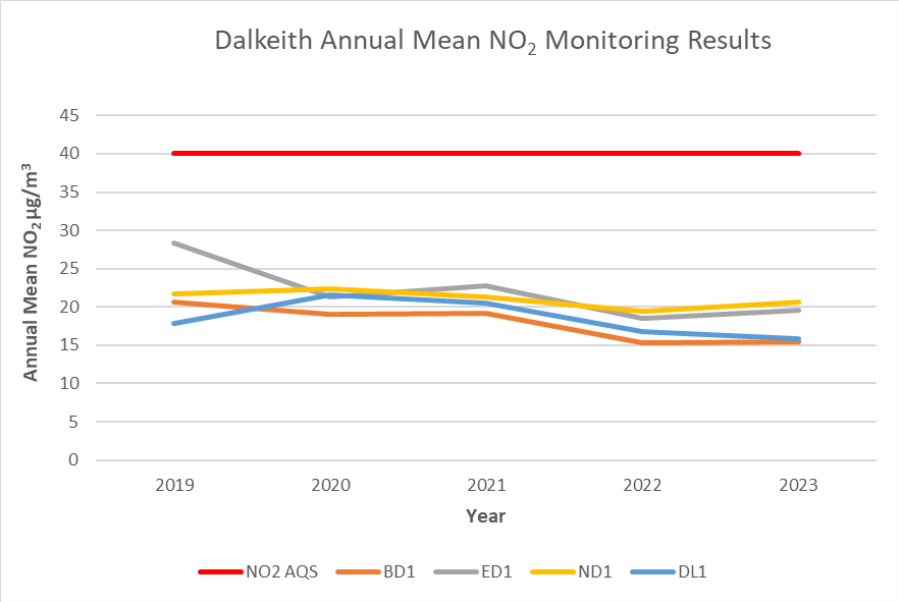


Chart A.2 – Lasswade Annual Mean NO<sub>2</sub> Monitoring Results

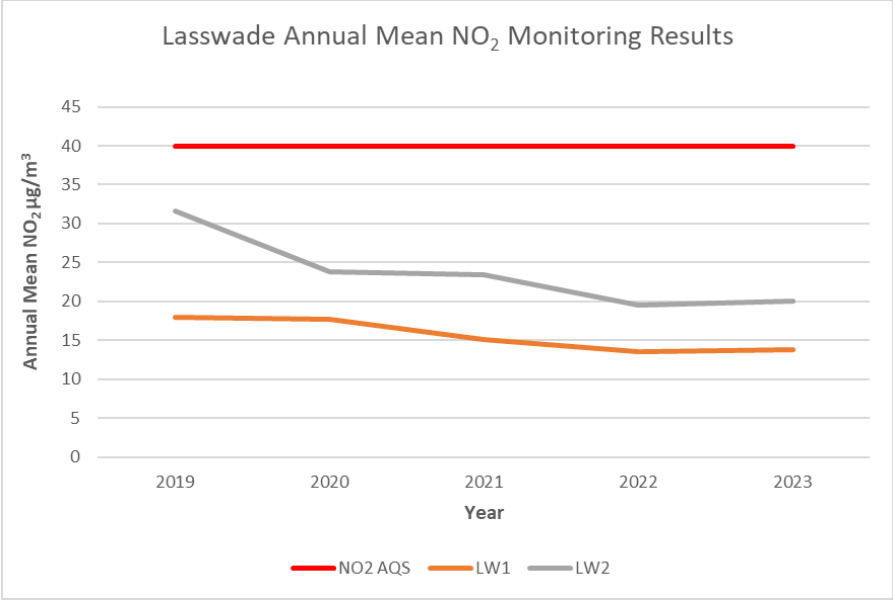


Chart A.3 – Loanhead Annual Mean NO<sub>2</sub> Monitoring Results

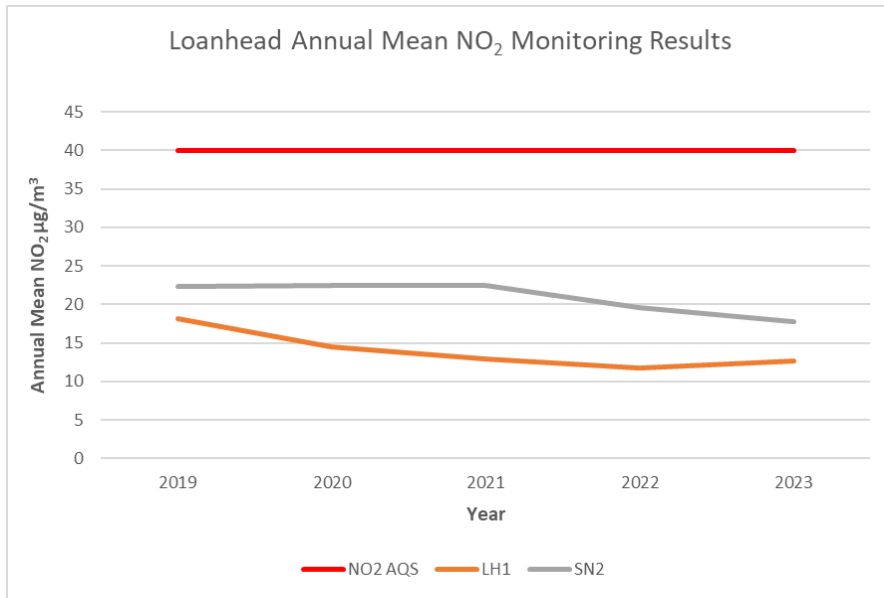


Chart A.4 – Penicuik, Pathhead and Bonnyrigg Annual Mean NO<sub>2</sub> Monitoring Results

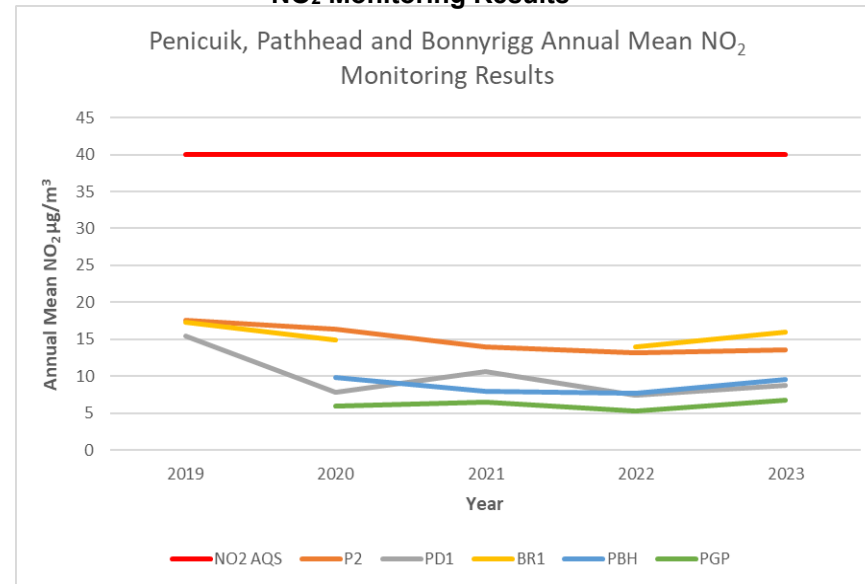
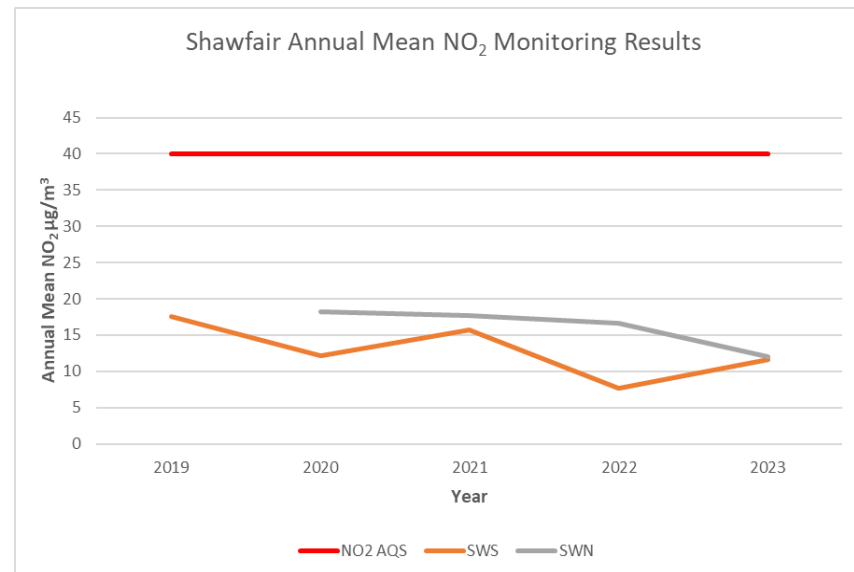


Chart A.5 – Shawfair Annual Mean NO<sub>2</sub> Monitoring Results



## Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO<sub>2</sub> 2023 Monthly Diffusion Tube Results (µg/m<sup>3</sup>)

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: Bias Adjusted
SWN	330662	670904	18.2	14.5	14.6	18	18.6	18.6	16.9	16.4	21.8	15.6	26.1	18.7	18.5	15.0
SWS	330309	669685	21.6	25.6	28.1	14	15.3	9	9.3	10.1	13.2	8.7	22.3	12.8	14.3	11.6
ED1	333206	667372	28.7	5.2	27.6	29.9	23.7	25.5	23.2	20.8	20.2	21.5	29.7	20.1	24.2	19.6
ND1	333410	667059	14.5	20	23.1	33.3	28.5	22.8	23.1	22.5	28.7	17.6	28.8	26.8	25.5	20.7
DL1	333247	667073	20.3	25	20.5	24.3	20.8	19.5	19.5	14.2	19.4	15.4	24.4	18.8	19.7	15.9
BD1	333055	667183	9.2	6.6	7.4	22.2	27.2	21.1	15.8	16.7	18.7	16.5	26.6	17.7	19.0	15.4

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: Bias Adjusted
DDC	334887	667957	9.1	10.7	12	9.9	9.9	6.5	4.6	5.9	6.5	5.5	13	8.2	8.2	6.6
PD1	339601	664172	12	11	10.5	12	13	11.4	9	8.5	9.2	9.5	15.2	8.6	10.7	8.7
BER	331798	665894	10.4	9.3	7.2	11.8	12.1	9.7	7.5	8.8	9.8	10.2	15.2	10.5	10.3	8.3
BCR	331424	664808	15.1	16	18.1	9.7	11.3	7.1	5.8	6.4	6.2	9.6	11.9	7.4	9.4	7.6
BR1	330895	665229	26.4	24.1	31.5	21.6	23	21	15.7	15.5	16.5	15.5	22.8	14.1	19.7	16.0
LW1	330343	666138	15.4	19.8	17.4	19.3	18.4	14.7	14.2	15.6	18.2	14.1	23	15.1	17.0	13.8
LW2	330470	666125	21.6	17.6	14.8	30.6	28.4	25.6	21.1	21.8	27.4	24.8	26.3	25.9	24.7	20.0

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: Bias Adjusted
LH1	328242	665585	9.5	10.4	8.3	21.1	18.2	16.9	12.6	15.5	16.3	13.8	21.7	12.9	15.7	12.7
PGP	324824	662115	11.6	12.5	11.6	11.7	9	5.9	4.8	4.4	7.8	6.8	13.1	7.1	8.2	6.7
PBH	324168	661503	15.3	17.5	15.8	9.6	10.5	7.5	14.6	6.5	10.1	9.3	13.7	19.2	11.7	9.5
P2	323677	661000	26.8	28.2	27	17.4	18.5	16.9	13.3	17.5	2.5	14	24.7	14.4	16.6	13.5
SN2	327262	666588	17.2	18.9	16	23.1	22.5	18	19.3	18.7	19.9	19.3	37.2	26.2	22.0	17.8

**Notes:**

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 Midlothian Council During 2023**

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

### **Additional Air Quality Works Undertaken by Midlothian Council During 2023**

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

### **QA/QC of Diffusion Tube Monitoring**

The diffusion tubes are analysed by Edinburgh Scientific Services (ESS) using the 50% triethanolamine (TEA) in acetone method.

ESS has confirmed that the procedures set out in the Harmonisation Practical Guidance are followed during the analysis. The laboratory is UKAS accredited for the analysis and also participates in the Workplace Analysis Scheme for Proficiency (WASP) scheme. ESS has reported that the results from the WASP scheme confirm that the laboratory is performing satisfactorily. The laboratory uses the 50% v/v triethanolamine (TEA) in acetone method where the adsorbent pads are dipped into this solution, dried and then inserted into the acrylic diffusion tubes. All exposure times and dates are recorded by Midlothian Council and sent to the laboratory with the exposed tubes. Midlothian Council also sends one unexposed tube with each batch to check that there has been no contamination during handling or analysis.

## Diffusion Tube Annualisation

All diffusion tube monitoring locations within Midlothian Council recorded data capture of 75% therefore it was not required to annualise any monitoring data.

## Diffusion Tube Bias Adjustment Factors

A summary of bias adjustment factors used by Midlothian Council over the past five years is presented in Table C.1. Midlothian Council have applied a national bias adjustment factor of 0.81 to the 2023 monitoring data (see table C.2).

Bias adjustment factors are determined by DEFRA using comparable studies according to site type and analysis methodology used. Midlothian Council NO<sub>2</sub> tubes are analysed by Edinburgh Scientific Services (ESS) using 50% TEA in acetone. The comparable study selected by DEFRA was a kerbside site at Marylebone Road, London as listed in their Spreadsheet of Bias Adjustment Factors March 2024 (Ref. 03/24). Midlothian Council can no longer calculate its own bias adjustment factor following the decommissioning of the Dalkeith Monitoring Station.

**Table C.1 – Bias Adjustment Factor**

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.81
2022	National	03/23	0.81
2021	National	09/22	0.85
2020	National	09/22	0.85
2019	National	06/19	0.96

## NO<sub>2</sub> Fall-off with Distance from the Road

No diffusion tube NO<sub>2</sub> monitoring locations within Midlothian Council required distance correction during 2023.



**Table C.2 – Local Bias Adjustment Calculations**

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/24			
Follow the steps below <b>in the correct order</b> to show the results of <b>relevant</b> co-location studies								This spreadsheet will be updated at the end of June 2024		
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods								LAQM Helpdesk Website		
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.										
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:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	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 <sup>3</sup> shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data <sup>2</sup>	If you have your own co-location study then see footnote <sup>4</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMhelpdesk@bureauveritas.com or 0800 0327953							
Analysed By <sup>1</sup>	Method	Year <sup>2</sup>	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision <sup>5</sup>	Bias Adjustment Factor (A) (Cm/Dm)
Edinburgh Scientific Services	50% TEA in acetone	2023	KS	Marylebone Road intercomparison	11	46	38	22.9%	P	<b>0.81</b>
Edinburgh Scientific Services	50% TEA in acetone	2023		<b>Overall Factor<sup>3</sup> (1 study)</b>				<b>Use</b>		<b>0.81</b>

## Appendix D: Diffusion tube location maps

Figure 1: Midlothian boundary with key towns, villages and significant roads

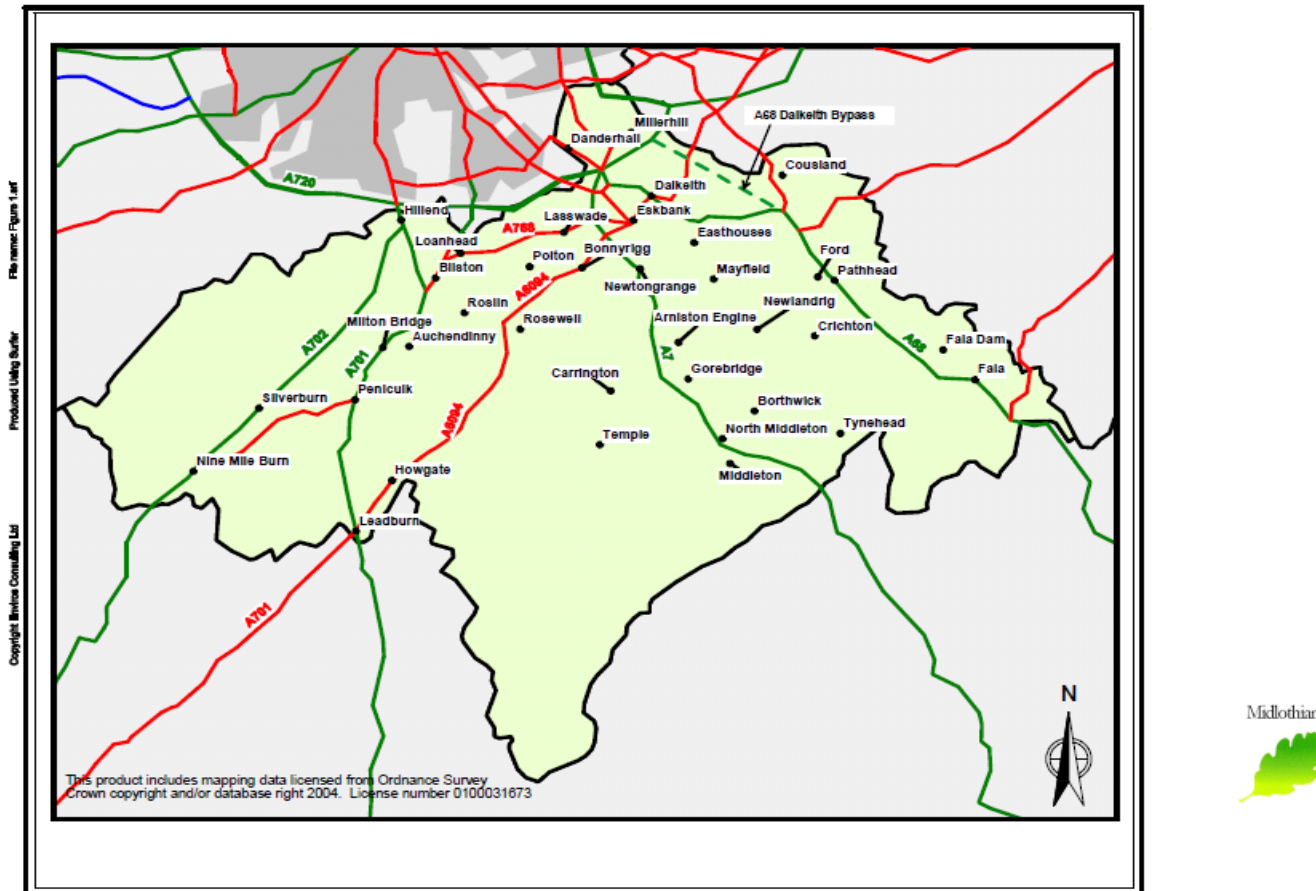


Figure 2: Extent of revoked AQMA, Pathhead

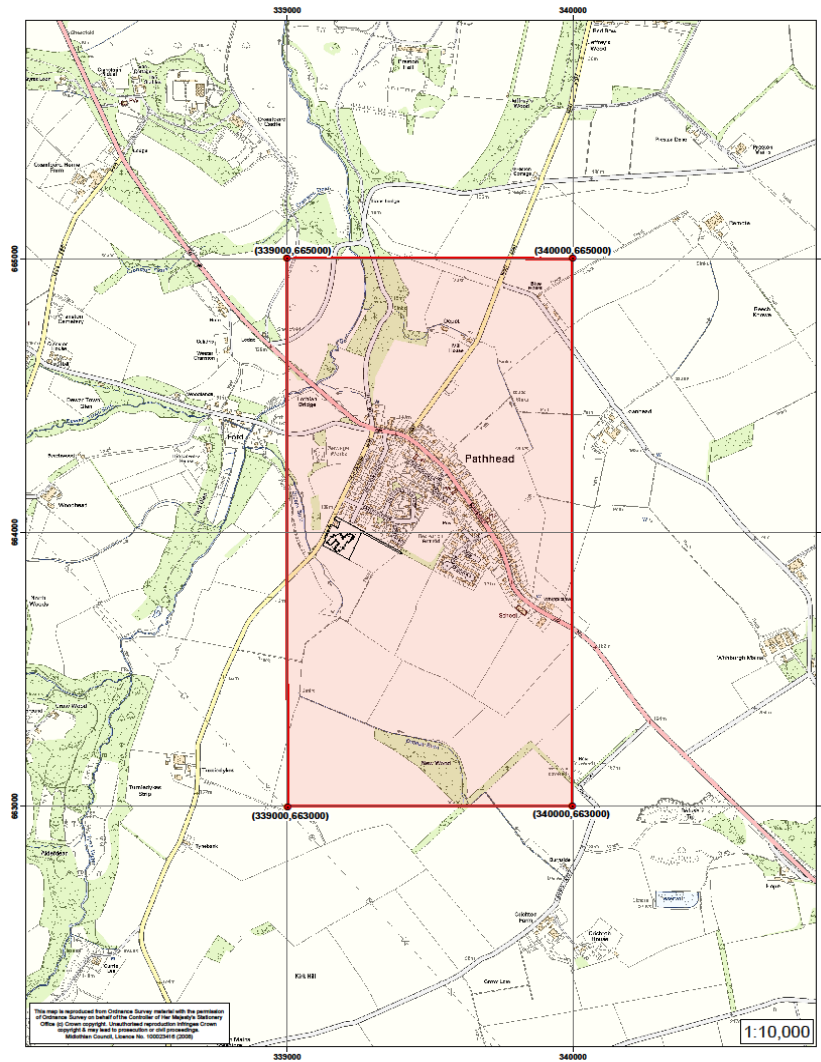


Figure 3: Diffusion tube and (decommissioned) automated monitoring station location, Dalkeith

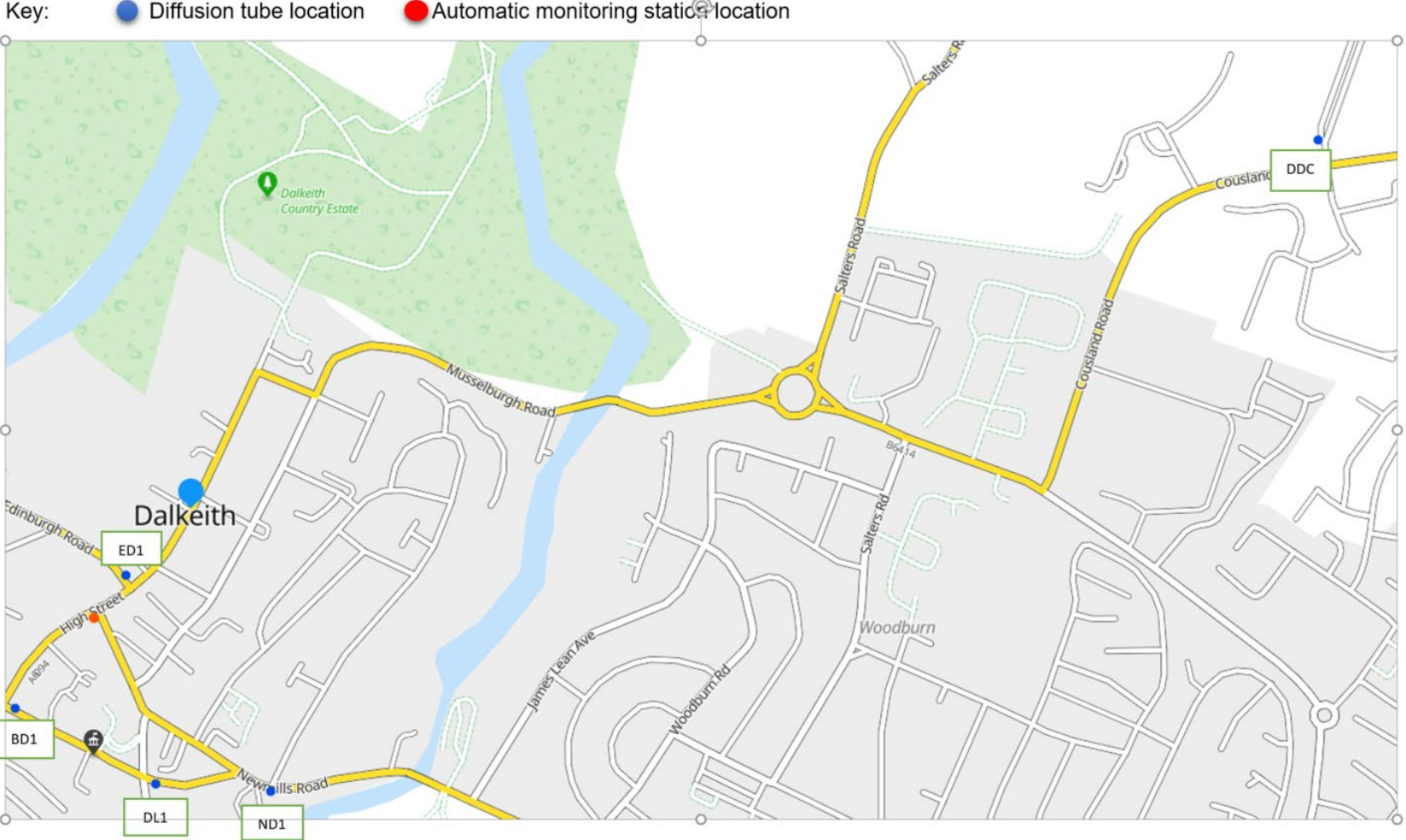


Figure 4: Diffusion tube location, Pathhead (note: automated monitoring station now removed)

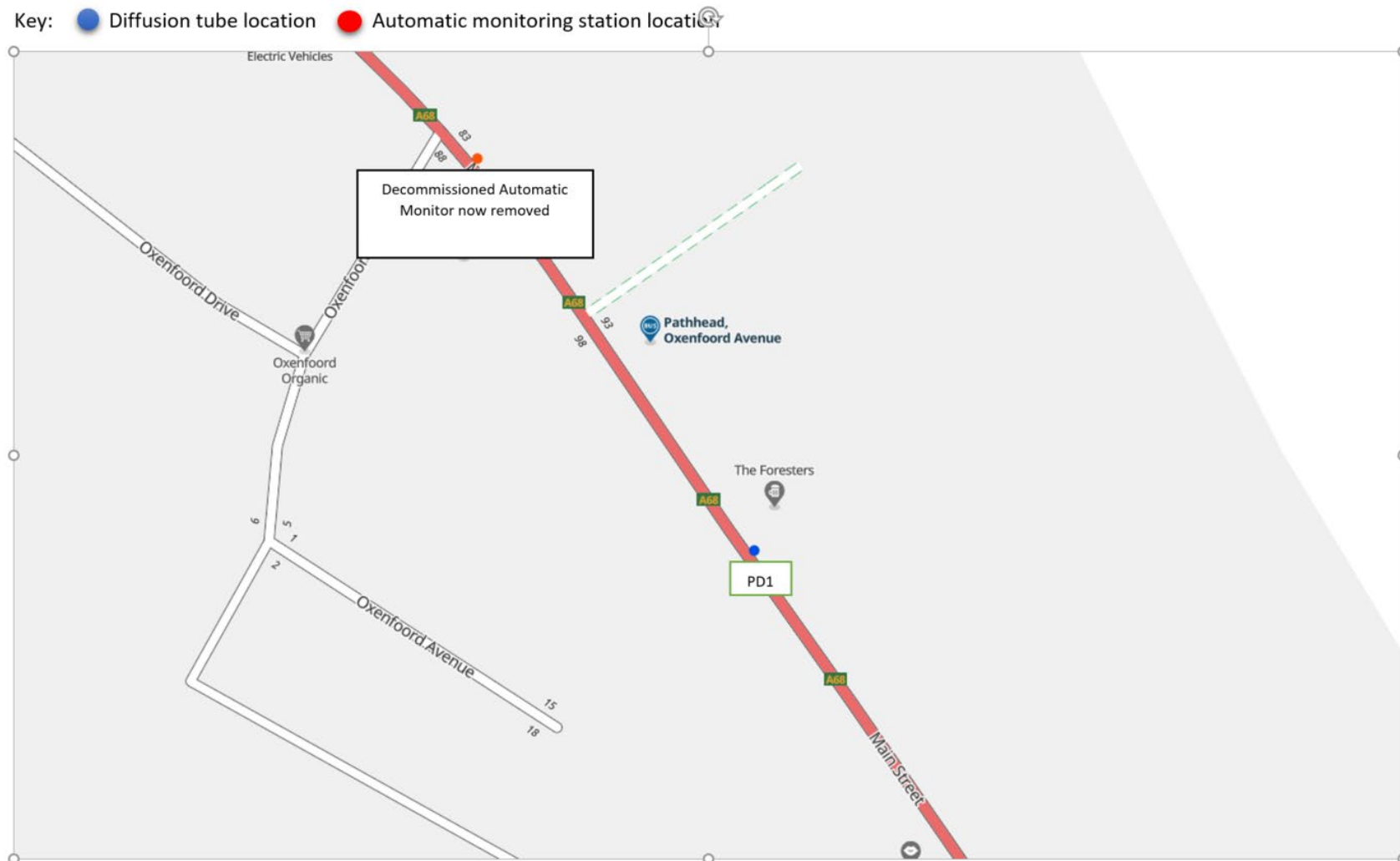


Figure 5: Diffusion tube location, Penicuik

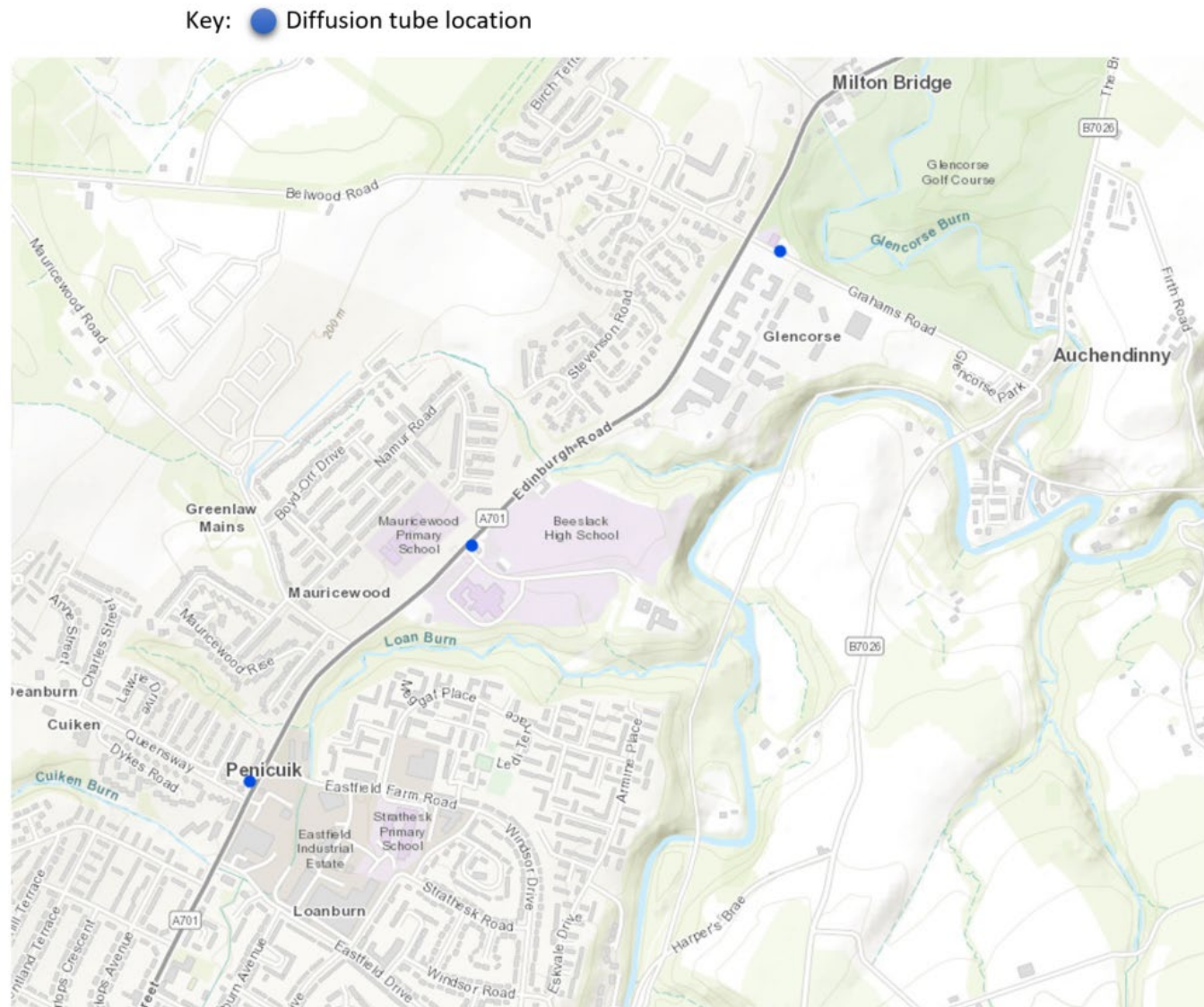


Figure 6: Diffusion tube location, Bonnyrigg

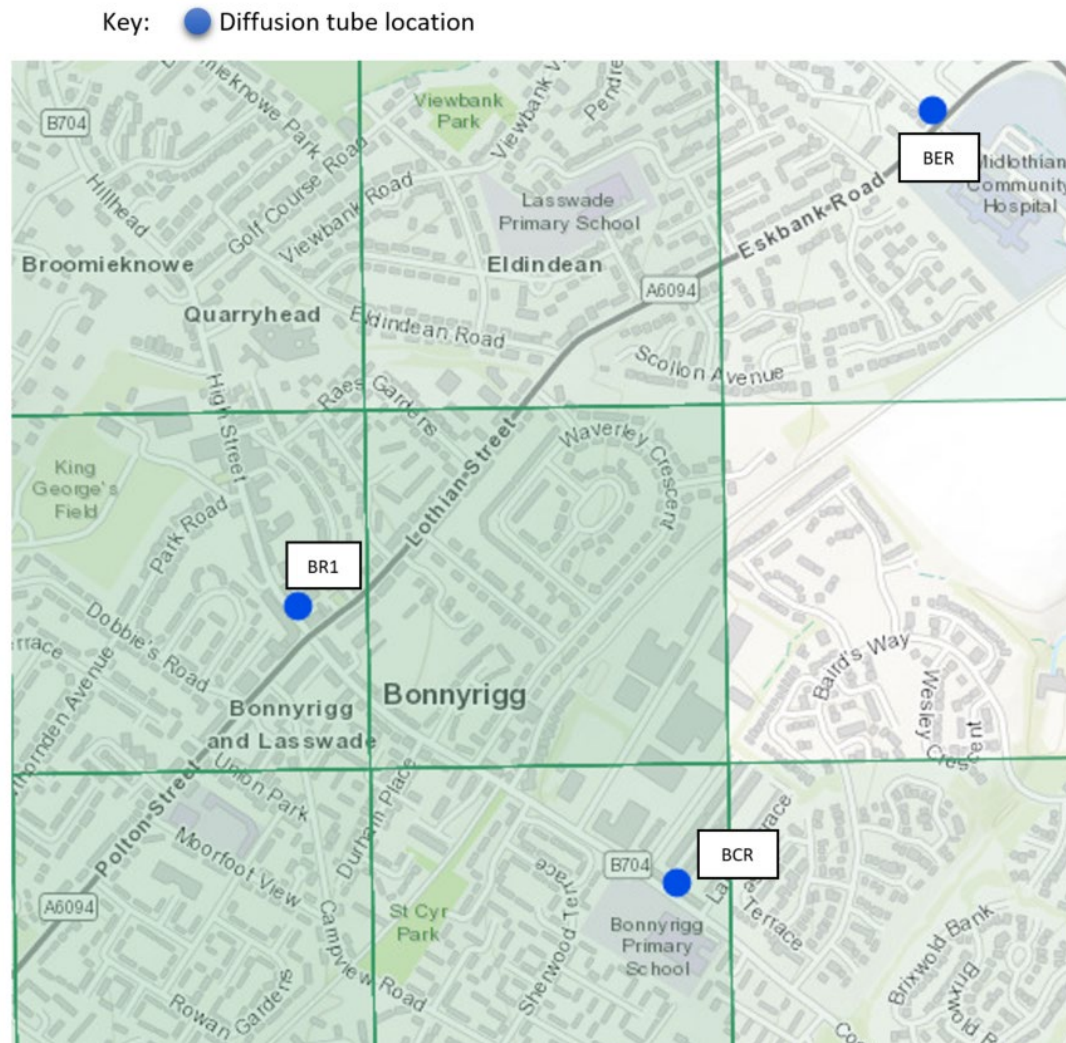


Figure 7: Diffusion tube location, Loanhead





Figure 8: Diffusion tube location, Lasswade

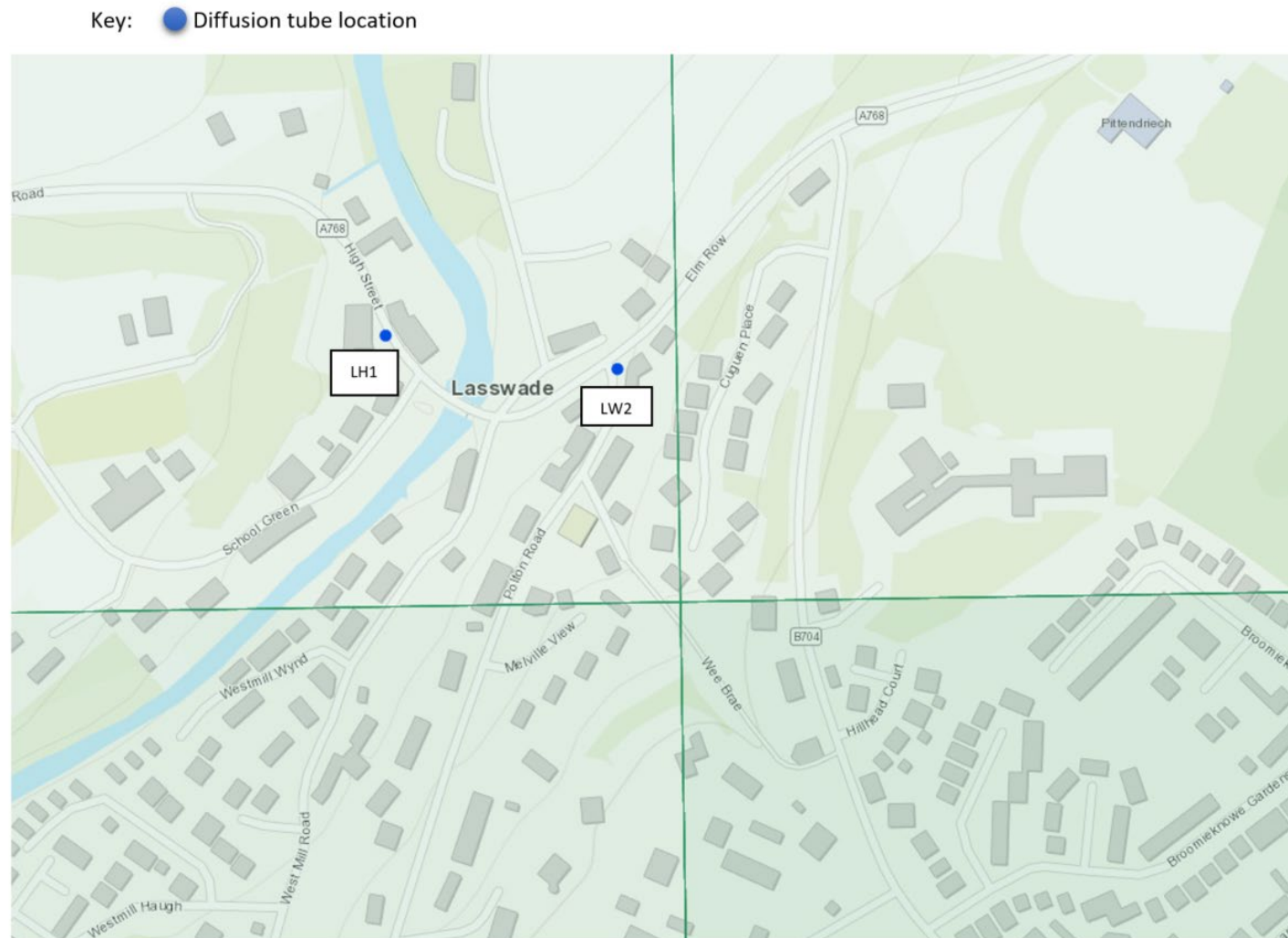
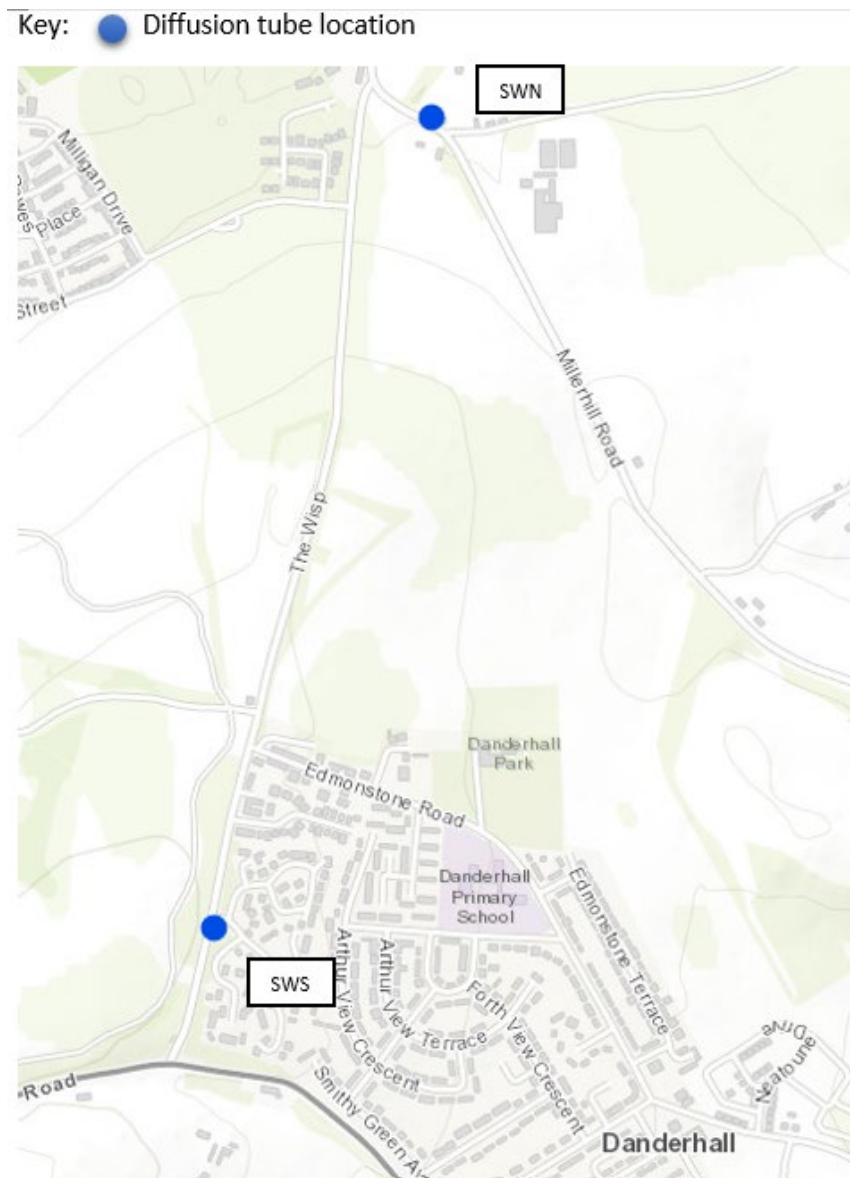


Figure 9: Diffusion tube location, Danderhall



## 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
DT	Diffusion Tube
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. Defra and the Devolved Administrations, Local Air Quality Management, Technical Guidance (TG22), August 2022.
2. Defra and the Devolved Administrations, National Bias Adjustment Factor Spreadsheet (Ref 03/24), accessed at [National Bias Adjustment Factors | LAQM \(defra.gov.uk\)](https://national-bias-adjustment-factors.laqm.defra.gov.uk)
3. <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>.
4. Cleaner Air for Scotland: The Road to a Healthier Future, Scottish Government
5. Midlothian Council Travel Plan 2017 to 2021
6. Midlothian Local Development Plan 2017