Annual Progress Report (APR)

2021 Air Quality Annual Progress Report (APR) for West Lothian Council

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

December 2021

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Executive Summary: Air Quality in Our Area

Air Quality in West Lothian

West Lothian Council has continued to review and assess air quality throughout the district in 2020 to determine whether or not air quality objectives are likely to be achieved. Air pollutants Nitrogen Dioxide (NO_2) and fine particles (PM_{10} & $PM_{2.5}$), which are mainly associated with vehicle emissions and domestic fuel burning, are measured using a network of three continuous air quality monitoring stations located in Linlithgow, Broxburn and Newton.

There are also 48 NO_x passive diffusion tubes located throughout West Lothian at 23 sites in total. There are two tubes co-located at 21 sites and three tubes co-located with the air quality monitoring stations at Broxburn and Linlithgow (Sites DT 4 and DT14) – we also employ 1 travel tube. Three new NO_x tube sites were added in April 2019. These were added in Winchburgh and East Calder due to new housing developments in these areas. All diffusion tube locations can be found on the Air Quality in Scotland website: http://www.scottishairquality.scot/latest/diffusion-sites.

There is also a diffusion tube location map at the end of this report in Appendix C.

West Lothian Council also had a solar powered AQ Mesh mobile monitor, which was relocated to East Calder Primary School for the whole of 2019. It was removed for repair in October 2019. In May 2020 the Council changed its Service Contract provider. Unfortunately, the new provider was unable to provide the same equipment but did offer a replacement monitor. At present nothing has been agreed on replacing the AQ Mesh monitor but this will be considered in the coming months.

The 2020 monitoring data at all three continuous air quality monitoring stations has shown that the NO_2 and PM_{10} long term average air quality objectives have been met. NO_2 at Linlithgow was lower in 2020 compared to 2019. PM_{10} levels also decreased at Linlithgow for 2020, compared to the previous year. In Broxburn, NO_2 and PM_{10} levels were lower compared to 2019. At the Newton Site, again NO_2 and PM_{10} levels were lower compared to the previous year. The main cause of this is likely to have been due to reduced road traffic, as “lockdown” travel restrictions were imposed at a national and regional level throughout the year to protect public health and minimise the spread of infection during the COVID 19

pandemic. With regard to the short term NO_2 and PM_{10} air quality objectives, there were no exceedances at any of the three sites.

In Linlithgow, the $PM_{2.5}$ level also decreased from the 2019 level during 2020. In Broxburn and Newton there was also a decrease in $PM_{2.5}$ levels compared to 2019.

NOx passive diffusion tubes located throughout West Lothian have not shown any exceedances during 2020.

Further information on the location of the AQMA's can be found at https://www.westlothian.gov.uk/article/34729/Air-Pollution

Actions to Improve Air Quality

The actions taken to improve air quality within West Lothian during 2020 include;

- Formal launch of the Eco Stars fleet recognition scheme was delayed during March 2020. However, membership of the scheme within West Lothian continued to increase with around 50 members (1833 vehicles) noted in march 2020 which increased to 111 members (3591 vehicles) by January 2021;
- West Lothian Council ordered 19 further electric pool vehicles to add to its fleet. 12 of these were to replace existing diesel fleet vehicles;
- In response to the Coronavirus pandemic during 2020, the Council implemented a range of temporary measures in West Lothian to make it safer for people who choose to walk, cycle or wheel for essential trips and exercise during Covid19. Nine packages of work were introduced, one of which was the introduction of localised footway widening at known narrow public footways. These footway widenings were installed at High Street in Linlithgow, Main Street in East Calder, Main Street in Mid Calder, Main Street in West Calder and Station Road in Kirknewton. These measures are constructed with temporary footway surfacing, temporary kerbing and removable reflective bollards.
- Continued use of electric vehicles within Environmental Health and Trading Standards along with greater use within the Council as a whole;

- Bikeability activities were restricted during 2020 due to ongoing school closures due to the Coronavirus pandemic. Level 1 Bikeability sessions were mostly delayed until the 2021 school term;
- During 2020, 7 new publicly available EV charging points were installed by West Lothian Council. One at Linlithgow Sports Club, two at the Strathbrock Centre in Broxburn and four at Morris Square, Livingston (the Morris Square ones did not become operational in 2020 due to power issues).
- West Lothian Council also continues to provide the management and administration support for the East Central Scotland Vehicle Emissions Partnership (VEP), which is in collaboration with several other local authorities. The remit of the VEP is to help reduce vehicle emissions by encouraging drivers to switch off their engine whenever possible, encourage good travel mode and vehicle choices and handling idling and emissions complaints. In addition, the VEP uses a broad variety of advertising media to encourage change in driving habits across the councils' areas. Media used includes local TV, radio, public transport networks such as buses and social media.

Widening of pavements in Linlithgow during the pandemic to encourage active travel

New EV charging point with public access installed at the Strathbrock Centre, Broxburn

New EV charging point with public access installed at the Strathbrock Centre, Broxburn

Local Priorities and Challenges

In West Lothian, as explained in last year's report the main priority is to complete the detailed assessments so as to determine whether the three Air Quality Management Areas (AQMAs) need to be revoked due to air pollution levels meeting the target air quality objectives for the previous three years. The detailed assessments will include land allocated for development and will detail whether there will be any potential future exceedances of pollutants at relevant receptors. Detailed traffic scenario modelling is still being carried out and there have been some delays with this to inform the detailed

assessments. Once this is complete the detailed assessments can then be finalised and a decision can be made on the future of the existing AQMAs. Unfortunately, this work was not progressed during 2020, due to other work priorities as a result of the Coronavirus pandemic.

Funding applications will continue to be made to the Scottish Government for monitoring apparatus and action plan measures.

During 2021 we will look to review our diffusion tube site locations and will also look to upgrade our continuous monitoring equipment. However, ongoing challenges may still arise due to the Coronavirus pandemic.

How to Get Involved

If you would like to find out more about air quality within West Lothian, please visit the Air Pollution pages of our website at https://www.westlothian.gov.uk/article/34729/Air-Pollution.

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1 Local Air Quality Management

This report provides an overview of air quality in West Lothian during 2020. 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 West Lothian 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	31.12.2020
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 an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives. Whilst West Lothian Council has three declared AQMA's, only one has an agreed action plan. The other two have draft action plans. As detailed later in this report, successive years of monitoring data within the AQMA's has shown that air pollution objective limits are being met comfortably. The Councils focus has therefore turned to the revocation of these AQMA's, although progress has so far been slow in actioning this, for various reasons.

A summary of AQMAs declared by West Lothian Council can be found in Table 2.1 below. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=390 see the full list of Air Quality Management areas at https://uk-air.defra.gov.uk/aqma/list

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
AQMA Linlithgow	• NO_2 annual mean • PM_{10} annual mean	Linlithgow	Includes Linlithgow, Linlithgow Bridge & land allocated for development	Draft Action Plan
AQMA Broxburn	• NO_2 annual mean • PM_{10} annual mean	Broxburn	West Main Street eastwards to western boundary of service station, Broxburn	Action Plan

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
AQMA Newton	• PM_{10} annual mean	Newton	The whole of Newton village	Draft Action Plan

2.2 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland's legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available on the Scottish Government's website. Progress by West Lothian Council against relevant actions within this strategy is demonstrated below.

2.1.1 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. West Lothian Council has a Carbon Management Plan, which can be found at the following link - https://www.westlothian.gov.uk/media/10480/West-Lothian-Council-Carbon-Management-Plan-2015-20/pdf/Carbon_Management_Plan_2015-2020.pdf

West Lothian Council also has an Active Travel Plan, found at this link - https://www.westlothian.gov.uk/media/12492/West-Lothian-Active-Travel-Plan-2016-21-Making-Active-Connections-/pdf/West_Lothian_Active_Travel_Plan_2016-212.pdf?m=635981217631570000. Local Active Travel Network plans are being developed as part of this plan, including in Linlithgow and Broxburn. This will aim to encourage cycling, walking and scooting opportunities for 'to school' and for shorter journeys in to town centres and villages.

2.1.2 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. West Lothian Council has a Climate Change Strategy which can be found here: https://www.westlothian.gov.uk/media/10479/West-Lothian-Council-Climate-Change-Strategy-2015-202/pdf/West_Lothian_Council_Climate_Change_Strategy_2015-202.pdf

West Lothian Council also has a Renewable Energy Strategy, which is found at the following link; https://www.westlothian.gov.uk/media/2612/Renewable-Energy-Strategy-in-2012/pdf/renewable-energy-strat.pdf?m=635318565999230000

2.3 Progress and Impacts of Measures to address Air Quality in West Lothian

West Lothian Council has taken forward a number of measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. More detail on these measures can be found in the air quality Action Plan relating to each AQMA. Key completed measures are:

- Progress with the EcoStars fleet management scheme within West Lothian made during 2020;
- Further uptake and use of electric vehicles within the Council's fleet management scheme.

Progress on the following measures has been slower than expected due to:

- Progress with the detailed assessments to work towards revocation of our Air Quality Management Areas. This has been down to staff workload pressures both in Environmental Health and in other departments that provide information to Environmental Health to allow us to begin the revocation process. The Coronavirus pandemic led to further delays with this work during 2020;

West Lothian Council expects the following measures to be completed over the course of the next reporting year:

- Work towards detailed assessments for the two draft AQAP and one finalised AQAP, so that we can start to consider revocation of the designated air quality management areas. Any such assessments will consider land allocated for development in the local development plan and will set out whether any future exceedances of pollutants at relevant receptors are likely.
- We may also look to carry out upgrades and improvements on our continuous monitoring stations where required;
- Look to review our diffusion tube monitoring locations across West Lothian so that we are monitoring at the most appropriate sites

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Electric Vehicle Charging Point Installation	Promoting low emission transport	Building a network for low emission vehicles	Env. Health	June 2016 onwards	Ongoing	Installation of EV charging points	Reduction in air pollution through encouraging the use of EV's	Ongoing program of installing chargers on Council land	Ongoing	Fulfils action plan measure 15 of Broxburn AQAP
2	Improving links with local planning & development framework	Policy guidance and development control	Air Quality Planning Guidance	Env. Health	November 2016 onwards	2019	Air Quality Planning Guidance approved by council executive	Reduction in Air Pollution	Air Quality Planning guidance approved but non-statutory	Completed in 2019	Fulfils action plan measure 2 of Broxburn AQAP
3	Active Travel and Cycling Infrastructure	Promoting Travel Alternatives	Bikeability Officer in post	West Lothian Leisure/West Lothian Council	2017/2018 onwards	From 2019 onwards	Post filled and training delivered to schools	Encouraging a reduction in car journeys	Post has been filled and training is being delivered although there were restricted activities during 2020 due to COVID 19	Ongoing	Fulfils action plan measure 20 of draft Linlithgow AQAP
	Ecostars fleet	Promoting low	Taken forward		2018/2019	Ongoing	Businesses being visited	Reduction in high	As of Jan.. 2021 West	Ongoing initiative	Fulfils action

4	recognition scheme	emission transport	by vehicle emissions partnership	Vehicle emissions partnership			by the scheme	emission journeys and vehicle	Lothian has 111 members with 3591 vehicles in scheme		plan measure 8 of draft Newton AQAP
5	Electric Pool Cars for council staff in an AQMA	Promoting low emission transport	Replacing petrol and diesel pool cars with electric pool cars	Fleet and Transportation	2019/ 2020	2019/2020	Pool cars available for use in Linlithgow	Reduction in high emission journeys and air pollution	Four electric pool cars in use. Removal of petrol and diesel vehicles	Ongoing	Fulfils action plan measure 20 of Linlithgow AQAP
6	Adoption of Residential Development Guide – Supplementary Guidance	Policy guidance and development control	Planning Guidance affecting air quality	Development Planning/ Env. Health	2019	2019	Supplementary Planning Guidance approved by council executive	Guidance on EV installation, air quality and other areas linked to improving Air Quality within AQMA and the wider area	Guidance is in place and all new residential applications for development are required to meet these standards	Ongoing	Fulfils action plan measure 2 of Broxburn AQAP
7	Removal of solid fuel fires in Council housing in Newton	Promoting low emission plants	Initiative to replace polluting solid fuel fires within Council housing stock with Air Source	Housing, Customer & Building Services	2008	Ongoing	Installation of Air Source heat Pumps in all 12 Council properties in Newton. 7 homes have been completed, 5 still to go	Reduction in particulate emitted as a result of solid fuel burning	The Council owns 12 homes in Newton, so far 7 have had air source heat pumps installed,	This is ongoing, some residents have refused the Air source heat pumps so they will	Draft Air Quality Action Plan Measure 5 – Reduce Emissions from non-

			Heat Pumps						with 5 still to be done	not be installed until the tenant moves out	transport sources

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

West Lothian Council undertook automatic (continuous) monitoring at three sites during 2020. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at http://www.scottishairquality.scot.

Maps showing the location of the monitoring sites are provided in Appendix C. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

West Lothian Council undertook non- automatic (passive) monitoring of NO_2 at 23 sites during 2020. Table A.2 in Appendix A shows the details of the sites. Two of the sites were moved slightly at the beginning of 2020 at East Main Street, Whitburn (DT8) and the Steel Yard, Bathgate (DT11). Due to work starting at Whitburn Partnership Centre we were not able to access the lamp post that had been used previously for DT8. Due to the regular loss of tubes at the Steelyard site, Bathgate (DT11), it was decided to slightly move the diffusion tubes. The Diffusion tubes were moved to different lamp posts but are still within the same general location. It had been some time since the 'distance to relevant exposure' and 'distance to kerb' values had been checked, so this exercise was carried out during 2020. As such, some of the distances will be different from previous years of reporting. Whilst there are 23 non-automatic monitoring sites, there are 49 diffusion tubes deployed each month. Two of the sites are the same as the continuous monitors – there are 3 tubes at each of these sites. However, at the other 21 sites there are 2 diffusion tubes. There is also one travel tube which is taken out with the other tubes during diffusion tube changes each month. This leads to the overall result at each site being an average reading. We

plan to review our non-automatic monitoring sites during 2021 to ensure that the most appropriate sites are being considered and it is likely that going forward, each site will only have one diffusion tube deployed, unless it is a continuous monitoring site.

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 also included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40 µg/m^3. The table shows that the annual mean objective was met at all three continuous monitoring sites, along with all the diffusion tube locations. Levels were down on last years figures and this is likely to be due to the effect of decreased travel during the COVID pandemic lockdowns.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year. There were no exceedences of this measure during 2020. With only one exceedence of this measure in the past 5 years (at Linlithgow in 2019), this measure has consistently been met across the continuous monitoring locations in West Lothian.

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 18µg/m^3. All three continuous monitoring sites have remained within the 18µg/m^3 limit. There was a noted

reduction in monitored levels since 2019 and this is likely to be due to decreased travel due to the COVID pandemic.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than seven times per year. There were no exceedences of this limit during 2020, which is a marked change from the findings of 2019. Once again, it is likely to be due to the effect of the pandemic and reduced vehicular movements.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations since 2017 when West Lothian Council started monitoring $PM^{2.5}$ at two of our continuous monitoring sites, with the air quality objective of 10µg/m^3. Monitoring at the Newton continuous monitor only started in 2019. Compared to 2019, measured $PM^{2.5}$ levels at all three sites have decreased slightly. This is once again likely to be showing the impact of reduced vehicle travel during the pandemic.

3.2.4 Sulphur Dioxide (SO_2)

During 2020 no monitoring of SO_2 was carried out in West Lothian.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

There was no monitoring of Carbon Monoxide, Lead or 1, 3-Butadiene in 2020.

4 New Local Developments

4.1 Road Traffic Sources

There were no new road traffic sources in 2020.

4.2 Other Transport Sources

There were no new other transport sources in 2020.

4.3 Industrial Sources

There was the following new industrial source during 2020;

- 0322/FUL/20 – Phase 2 thermal treatment plant at Levenseat

4.4 Commercial and Domestic Sources

Installation of domestic wood burning stoves continues to grow within West Lothian. There have been various planning applications received both within and out-with AQMA's during 2020. These applications are generally given consent subject to flue height and are given advice in line with DEFRA requirements for approved stoves and smokeless fuel etc.

There were no applications for any larger scale commercial or domestic developments during 2020.

4.5 New Developments with Fugitive or Uncontrolled Sources

There were no new fugitive or uncontrolled sources in 2020.

5 Planning Applications

West Lothian Council has been subject to the following planning applications in 2020 which may affect air quality;

- 0801/FUL/20 CALA, Deanburn Road, Linlithgow – erection of 60 homes with associated works

6 Impact of COVID-19 upon LAQM

Lockdown commenced on 23 March 2020 and there was a subsequent impact on the ability to change diffusion tubes in line with the calendar and also in carrying out routine LSO duties. Diffusion tubes were not changed at the end of March 2020 until it was established that it was safe to go and change these and permitted under the lockdown restrictions. Normal activities resumed at the end of April 2020, which was still within the lockdown period, but it had been established that it was safe to undertake this work at that time. The LAQM helpdesk was contacted for advice before resuming theses activities and since the work was generally outside, with little to no contact with anyone else, it was decided to resume normal work.

For the remainder of 2020, the diffusion tubes were changed in accordance with the Diffusion Tube monitoring calendar. There are no on-going issues with our local air quality monitoring network related to the Covid-19 response.

West Lothian Council did not carry out any additional, low cost monitoring during 2020.

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

All long-term air quality objective levels were met in 2020 at all monitoring sites. There were also no short-term exceedances of any objective. It is noted that measured levels were less than in 2019 and this is likely to be due to reduced travel during the COVID pandemic. There are now several years of data showing results below the air quality monitoring objectives. As in previous years, work had been planned to carry out detailed assessments to establish whether all three AQMA's could be revoked. Unfortunately, due to pressures on Environmental Health and other departments due to the COVID pandemic, this was not progressed during 2020.

7.2 Conclusions relating to New Local Developments

There have been no new local developments that have the potential to introduce new exceedances of relevant air quality objectives in West Lothian. The Local Development Plan for West Lothian identifies various residential sites in and around the AQMAs. It's likely that these will introduce further traffic related emissions and may be subject to Air Quality Impact Assessments (AQIAs), as and when they arise. These will be considered in line with our adopted Air Quality Supplementary Planning Guidance.

7.3 Proposed Actions

Monitoring data for 2020 has not highlighted any need for additional monitoring to take place. There are no new exceedances of the objectives for any pollutant measured. Whilst measured levels were down during 2020, for reasons previously explained, it can be shown that levels of pollutants in West Lothian have continued to be comfortably below air quality objective limits for several years.

As per last year's report, the draft Linlithgow and Newton Air Quality Action Plans and the Broxburn Air Quality Action Plan may be superseded by Detailed Assessments. Any such assessments will consider land allocated for development in the local development plan and will set out whether any future exceedances of pollutants at relevant receptors are likely. West Lothian Council will aim to work towards assessing whether the current

AQMA's should be revoked with the use of detailed assessments and further modelling as required. This work will proceed as soon as information is available and resources allow.

West Lothian Council will continue to apply to the Scottish Government for funding to assist with monitoring equipment and action plan measures.

We will look to review our diffusion tube monitoring to ensure that the most up to date and relevant sites are being considered for monitoring. We will aim to use traffic data, where available, and local knowledge of new developments in order to carry out this review.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Linlithgow High St	Roadside	300426	677172	NO_2; PM_{10};$PM_{2.5}$,	Y Linlithgow	FIDAS; NOX Analyser	4	1.36	2.32
CM2	Broxburn CNC	Roadside	308314	672231	NO_2; PM_{10};$PM_{2.5}$	Y Broxburn	FIDAS; NOX Analyser	3.5	2.20	2.36
CM3	Newton CNC	Roadside	309258	677728	NO_2; PM_{10}: $PM_{2.5}$	Y Newton	FDMS; NOX Analyser	1.8	1.92	2.41

Notes:
(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).
(2) N/A if not applicable.

Table A.2 – 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)
DT1	Newton	Roadside	309223	677711	NO_2	Y Newton	3	1.6	N	2.4
DT2	Broxburn WMS	Roadside	308165	672222	NO_2	Y Broxburn	Façade	3.3	N	2.5
DT3	Broxburn EMS	Roadside	308426	672233	NO_2	Y Broxburn	Façade	4	N	1.8
DT4	Broxburn CNC	Roadside	308314	672231	NO_2	Y Broxburn	3.2	1.7	Y	2.5
DT5	Broxburn E Mains	Roadside	309368	672213	NO_2	Y Broxburn	5	1.5	N	2.7
DT6	Dedridge Cedric Rise	Urban Background	306403	666341	NO_2	N	2.5	1.6	N	2.4
DT7	West Calder	Roadside	301758	663158	NO_2	N	2	2	N	2.5
DT8	Whitburn	Roadside	294687	665030	NO_2	N	2	0.5	N	2.2
DT9	Armadale Cross	Roadside	293842	668588	NO_2	N	3	1.4	N	2.3
DT10	Bathgate South Bridge St	Roadside	297401	668772	NO_2	N	1	1.5	N	2.1
DT11	Bathgate Steelyard	Roadside	297467	668734	NO_2	N	Façade	2	N	2.5
DT12	Bathgate King St	Roadside	297570	668586	NO_2	N	5	4	N	2.5

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)
DT13	Bathgate High St	Urban Background	297656	669298	NO_2	N	3	10	N	1.5
DT14	Linlithgow CNC	Roadside	300412	677124	NO_2	Y Linlithgow	4	1.36	Y	2.5
DT15	Linlithgow H ST NW	Roadside	299930	677070	NO_2	Y Linlithgow	2	1.4	N	2.4
DT16	Linlithgow H ST SW	Roadside	299911	677052	NO_2	Y Linlithgow	2	2.9	N	2.3
DT17	Linlithgow H ST NE	Roadside	300479	677148	NO_2	Y Linlithgow	3.4	2	N	1.5
DT18	Linlithgow H ST SE	Roadside	300485	677125	NO_2	Y Linlithgow	7.5	1.5	N	2.6
DT19	Linlithgow H ST N	Roadside	300398	677132	NO_2	Y Linlithgow	Façade	2.4	N	2.0
DT20	Linlithgow H ST S	Roadside	300405	677118	NO_2	Y Linlithgow	Façade	3	N	2.7
DT21	Main Street, East Calder	Roadside	308641	667912	NO_2	N	2.0	1.8	N	2.7
DT22	Butchers, Winchburgh	Roadside	308957	675025	NO_2	N	Façade	1.8	N	2.5
DT23	Main Street, Winchburgh	Roadside	309133	675028	NO_2	N	Façade	1.5	N	2.7

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.3 – Annual Mean NO_2 Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	Roadside	Automatic	-	71%	38	31	28	30	16.4(3)
CM2	Roadside	Automatic	-	91%	32	30	27	27	19
CM3	Roadside	Automatic	-	48%	17(3)	19	17	18	12.6(3)
DT1	Roadside	Diffusion Tube	-	67%	4.2	23.3	21.1	20.7	8.7
DT2	Roadside	Diffusion Tube	-	75%	27.7	26.2	26.5	23.2	12.3
DT3	Roadside	Diffusion Tube	-	75%	25.7	25.5	22.2	22.2	11.6
DT4	Roadside	Diffusion Tube	-	83%	32.4	28.4	28.0	27.2	15.5
DT5	Roadside	Diffusion Tube	-	83%	26.9	26.7	22.5	22.6	13.5
DT6	Urban Background	Diffusion Tube	-	83%	14.6	12.1	12.1	11.6	6.9
DT7	Roadside	Diffusion Tube	-	83%	26.8	22.1	20.7	20.8	11.4
DT8	Roadside	Diffusion Tube	-	83%	26.1	23.9	20.5	23.8	14.9
DT9	Roadside	Diffusion Tube	-	75%	25.8	25.2	23.1	24.2	12.6
DT10	Roadside	Diffusion Tube	-	75%	17.0	18.9	16.4	16.8	8.6
DT11	Roadside	Diffusion Tube	-	58%	28.7	28.0	24.5	26.6	9.1
DT12	Roadside	Diffusion Tube	-	83%	28.6	27.2	26.6	26.3	15.3
DT13	Urban Background	Diffusion Tube	-	83%	11.0	10.7	9.9	9.5	6.1
DT14	Roadside	Diffusion Tube	-	83%	33.0	31.6	26.9	25.3	13.9
DT15	Roadside	Diffusion Tube	-	75%	30.0	28.1	24.7	24.6	11.8
DT16	Roadside	Diffusion Tube	-	75%	34.4	33.9	29.2	29.4	13.8
DT17	Roadside	Diffusion Tube	-	75%	25.7	25.7	21.8	26.7	9.9
DT18	Roadside	Diffusion Tube	-	75%	30.1	30.6	25.4	22	11.5
DT19	Roadside	Diffusion Tube	-	67%	28.8	26.5	22.7	22.4	8.9
DT20	Roadside	Diffusion Tube	-	83%	31.7	30.8	26.6	25.1	13.9
DT21	Roadside	Diffusion Tube	-	67%	N/A	N/A	N/A	12.9	6.3
DT22	Roadside	Diffusion Tube	-	75%	N/A	N/A	N/A	16.2	9.0
DT23	Roadside	Diffusion Tube	-	67%	N/A	N/A	N/A	13.0	7.7

Notes:

Exceedances of the NO_2 annual mean objective of 40$\mu g/m^3$ 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.

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

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

(3) All means have been "annualised" as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	Roadside	Automatic	N/A	71%	0	0	0	**1**	0
CM2	Roadside	Automatic	N/A	91%	0	0	0	0	0
CM3	Roadside	Automatic	N/A	48%	0	0	0	0	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200 µg/m^3 not to be exceeded more than 18 times/year) are shown in bold.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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.5 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	Roadside	N/A	63%	14	9	11	12	8(7.7)
CM2	Roadside	N/A	99%	15	14	13	14	11
CM3	Roadside	N/A	68%	15	**15(17) (3)**	14	14	11(11.3)

Notes:

Exceedances of the PM_{10} annual mean objective of 18 $\mu g/m^3$ are shown in bold.

All means have been "annualised" as per LAQM.TG(16), where 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.6 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	Roadside	N/A	63%	0	0	0	**5**	0
CM2	Roadside	N/A	99%	0	0	0	**4**	0
CM3	Roadside	N/A	68%	0	0	**1**	**2**	0

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50 µg/m^3 not to be exceeded more than seven times/year) are shown in bold.

If the period of valid data is less than 85%, the 98.1st percentile of 24-hour means is provided in brackets.

(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.7 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CM1	Roadside	N/A	63%	n/a	5	6	7	5
CM2	Roadside	N/A	99%	n/a	6	7	8	6
CM3	Roadside	N/A	68%	n/a	n/a	n/a	10(9.4)	8

Notes:

Exceedances of the $PM_{2.5}$ annual mean objective of 10 µg/m^3 are shown in bold.

All means have been "annualised" as per LAQM.TG(16), where 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 2020

Table B.1 – NO_2 2020 Monthly Diffusion Tube Results ($\mu g/m^3$)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1) (0.68)	National Bias Adjusted (0.76)	Data Capture
DT1	22.4	23.4	No data	No data	13.2	13.7	13.9	18.5	21.9	No data	No data	26.3	**12.8**	8.7	9.7	67%
DT2	28.3	24.9	No data	No data	15.9	18.9	15.2	24.1	25.4	No data	28.9	35.3	**18.1**	12.3	13.8	75%
DT3	29.2	No data	No data	No data	14.8	15.6	15.1	19.5	23.2	26.9	28.5	32.1	**17.1**	11.6	13.0	75%
DT4	26.6	34.6	No data	No data	19.3	24.4	18.7	29.2	30.8	25.5	23.9	41.5	**22.8**	15.5	17.3	83%
DT5	24.2	21.6	No data	No data	15.6	24.6	14.6	24.1	24.8	28.9	26.4	34.4	**19.9**	13.5	15.1	83%
DT6	13.3	13.4	No data	No data	6.2	7.2	6.2	9.4	12.1	13.7	17.9	21.5	**10.1**	6.9	7.7	83%
DT7	20.9	20.8	No data	No data	13.3	18	14.1	21.3	21.1	23.4	23.2	26	**16.8**	11.4	12.8	83%
DT8	27	27.3	No data	No data	20.5	20.2	19.8	25.6	27.6	28.8	29.4	36.5	**21.9**	14.9	16.6	83%
DT9	36.7	33.3	No data	No data	14.9	12.7	20.4	19.2	24.2	29.7	No data	30.8	**18.5**	12.6	14.1	75%
DT10	20.4	19.9	No data	No data	11.2	10.2	11.1	15.6	17.2	21.1	No data	25.6	**12.7**	8.6	9.7	75%
DT11	32.5	28.4	No data	No data	14.7	14.6	17.1	19.6	No data	No data	33.5	No data	**13.4**	9.1	10.2	58%

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1) (0.68)	National Bias Adjusted (0.76)	Data Capture
DT12	31.6	28.9	No data	No data	15.9	18.3	15.8	23.6	29.4	32.3	34.7	39.9	**22.5**	15.3	17.1	83%
DT13	13.9	13.8	No data	No data	5.9	5.3	5.4	6.8	9.9	10.7	16.4	18.3	**8.9**	6.1	6.8	83%
DT14	30.9	30.1	No data	No data	13.7	16.7	15.4	23.1	25.1	25.3	30.5	34.4	**20.4**	13.9	15.5	83%
DT15	26.7	25.1	No data	No data	No data	15.4	13.7	20.6	23.3	25.3	25.2	32.1	**17.3**	11.8	13.2	75%
DT16	39.1	No data	No data	No data	16.3	21.7	18.7	24.6	27.3	30.8	31.4	33.7	**20.3**	13.8	15.4	75%
DT17	25.6	23.9	No data	No data	10.6	9.9	11.5	No data	20.2	21.4	22.4	28.1	**14.5**	9.9	11.0	75%
DT18	30.7	27.7	No data	No data	12.9	14.5	15.1	19.5	23.9	No data	28.1	29.7	**16.9**	11.5	12.8	75%
DT19	23.5	22.2	No data	No data	12.6	15.6	11.4	20.4	21.9	No data	No data	29.7	**13.1**	8.9	10	67%
DT20	34.7	30.1	No data	No data	12.7	16.6	16.6	22.5	24.5	27.4	28.5	32.1	**20.4**	13.9	15.5	83%
DT21	20.2	16.5	No data	No data	9.1	10.1	8.3	10.9	13.7	No data	No data	22.4	**9.3**	6.3	7.1	67%
DT22	24.5	No data	No data	No data	10.9	11	10.8	15.2	17.8	20.4	24.6	24	**13.3**	9.0	10.1	75%
DT23	19.6	No data	No data	No data	No data	10.2	11.1	12.8	15.6	18.9	22.3	24.8	**11.3**	7.7	8.6	67%

Notes:

(1) See Appendix C for details on bias adjustment

Table B.2 - Historical Monthly Diffusion Tube Results

SITE ID	2016 Raw data	2016 Bias adjusted data	2017 Raw data	2017 Bias adjusted data	2018 Annual Raw data	2018 Bias adjusted data	2019 Annual Raw data	2019 Bias adjusted data	2020 Annual Raw data	2020 Bias adjusted data
DT1	26.6	24.2	24	23.3	26.4	21.1	26.9	20.7	12.8	8.7
DT2	30.4	27.7	27	26.2	33.1	26.5	30.1	23.2	18.1	12.3
DT3	28.2	25.7	26.3	25.5	27.7	22.2	28.8	22.2	17.1	11.6
DT4	35.6	32.4	29.3	28.4	35.0	28.0	35.3	27.2	22.8	15.5
DT5	29.6	26.9	27.5	26.7	28.1	22.5	29.4	22.6	19.9	13.5
DT6	16.0	14.6	12.5	12.1	15.1	12.1	15.1	11.6	10.1	6.9
DT7	29.4	26.8	22.8	22.1	25.9	20.7	27	20.8	16.8	11.4
DT8	28.7	26.1	24.6	23.9	25.6	20.5	30.9	23.8	21.9	14.9
DT9	28.3	25.8	26	25.2	28.9	23.1	31.4	24.2	18.5	12.6
DT10	18.7	17.0	19.5	18.9	20.5	16.4	21.8	16.8	12.7	8.6
DT11	31.5	28.7	28.9	28.0	30.6	24.5	34.5	26.6	13.4	9.1
DT12	31.4	28.6	28	27.2	33.2	26.6	34.2	26.3	22.5	15.3
DT13	12.1	11.0	11	10.7	12.4	9.9	12.3	9.5	8.9	6.1
DT14	36.3	33.0	23.3	31.6	33.6	26.9	32.8	25.3	20.4	13.9

SITE ID	2016 Raw data	2016 Bias adjusted data	2017 Raw data	2017 Bias adjusted data	2018 Annual Raw data	2018 Bias adjusted data	2019 Annual Raw data	2019 Bias adjusted data	2020 Annual Raw data	2020 Bias adjusted data
DT15	33	30.0	26.2	28.1	30.9	24.7	32	24.6	17.3	11.8
DT16	37.8	34.4	25.5	33.9	36.5	29.2	38.2	29.4	20.3	13.8
DT17	28.2	25.7	28.4	25.7	27.2	21.8	25.9	26.7	14.5	9.9
DT18	33.1	30.1	26.7	30.6	31.7	25.4	28.6	22	16.9	11.5
DT19	31.6	28.8	12.1	26.5	28.4	22.7	29.1	22.4	13.1	8.9
DT20	34.8	31.7	22.1	30.8	33.3	26.6	32.6	25.1	20.4	13.9
DT21	N/A	N/A	N/A	N/A	N/A	N/A	16.7	12.9	9.3	6.3
DT22	N/A	N/A	N/A	N/A	N/A	N/A	21.1	16.2	13.3	9.0
DT23	N/A	N/A	N/A	N/A	N/A	N/A	16.9	13.0	11.3	7.7

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

New or Changed Sources Identified Within West Lothian Council During 2020

West Lothian Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by West Lothian Council During 2020

West Lothian Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

- The supplier used for diffusion tubes within 2020 in West Lothian was SOCOTEC and the method of preparation that was used was by spiking Acetone: Triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow auto analyser with ultraviolet detection.
- The samples have been analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance. As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11^{o}C, the reported values **have** been adjusted to 20^{o}C to allow for direct comparison with EU limits. This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and assessments requiring exposure details and conditions fall outside the scope of our accreditation. In the AIR PT inter comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a **Satisfactory** laboratory.
- The same diffusion tube supplier was used in West Lothian throughout 2020.

- West Lothian changed the diffusion tubes in accordance with the LAQM Nitrogen Dioxide Diffusion tube monitoring calendar throughout 2020 apart from when the tubes were placed out for March exposure and they were changed one week late due to the tubes being supplied late. Therefore, the tubes were changed on 10th March 2020 instead of 3rd March 2020. The tubes were then not changed again until 30th April 2020 which was due to the impact from the Covid-19 lockdown.

Diffusion Tube Annualisation

Annualisation has been applied to some of the Diffusion tube sites in West Lothian where the data capture was less than 75%. This has been applied to sites DT1, DT11, DT19, DT21 & DT23. This can be seen in Table C.1 below.

Figure C.1 - Screenshot from Bureau Veritas Diffusion Tube Annualisation Tool

2	Bias Adjustment Factor	0.68	Is the bias adjustment factor as entered correct?														
3	Raw Diffusion Tube Data																
				NO_2 Monthly Concentration Data ($\mu g/m^3$)													
	Diffusion Tube ID	Duplicate/Triplicate ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Requires Annualisation?
	DT 1		309223	677711	22.4	23.4	No data	No data	13.2	13.7	13.9	18.5	21.9	No data	No data	26.3	YES
	DT 2		308165	672222	28.3	24.9	No data	No data	15.9	18.9	15.2	24.1	25.4	No data	28.9	35.3	NO
	DT 3		308426	672233	29.2	No data	No data	No data	14.8	15.6	15.1	19.5	23.2	26.9	28.5	32.1	NO
	DT 4		308314	672231	26.6	34.6	No data	No data	19.3	24.4	18.7	29.2	30.8	25.5	23.9	41.5	NO
	DT 5		309368	672213	24.2	21.6	No data	No data	15.6	24.6	14.6	24.1	24.8	28.9	26.4	34.4	NO
	DT 6		306403	666341	13.3	13.4	No data	No data	6.2	7.2	6.2	9.4	12.1	13.7	17.9	21.5	NO
	DT 7		301758	663158	20.9	20.8	No data	No data	13.3	16	14.1	21.3	21.1	23.4	23.2	26	NO
	DT 8		294687	665030	27	27.3	No data	No data	20.5	20.2	19.8	25.6	27.6	28.8	29.4	36.5	NO
	DT 9		293842	668558	36.7	33.3	No data	No data	14.9	12.7	20.4	19.2	24.2	29.7	No data	30.8	NO
	DT 10		297401	668702	20.4	19.9	No data	No data	11.2	10.2	11.1	15.6	17.2	21.1	No data	25.6	NO
	DT 11		297467	668734	32.5	28.4	No data	No data	14.7	14.6	17.1	19.6	No data	No data	33.5	No data	YES
	DT 12		297570	668586	31.6	28.9	No data	No data	15.9	18.3	15.8	23.6	29.4	32.3	34.7	39.9	NO
	DT 13		297656	669298	13.9	13.8	No data	No data	5.9	5.3	5.4	6.8	9.9	10.7	16.4	18.3	NO
	DT 14		300412	677124	30.9	30.1	No data	No data	13.7	16.7	15.4	23.1	25.1	25.3	30.5	34.4	NO
	DT 15		299930	677070	26.7	25.1	No data	No data	No data	15.4	13.7	20.6	23.3	25.3	25.2	32.1	NO
	DT 16		299911	677052	39.1	No data	No data	No data	16.3	21.7	18.7	24.6	27.3	30.8	31.4	33.7	NO
	DT 17		300479	677148	25.6	23.9	No data	No data	10.6	9.9	11.5	No data	20.2	21.4	22.4	28.1	NO
	DT 18		300485	677125	30.7	27.7	No data	No data	12.9	14.5	15.1	19.5	23.9	No data	28.1	29.7	NO
	DT 19		300398	677132	23.5	22.2	No data	No data	12.6	15.6	11.4	20.4	21.9	No data	No data	29.7	YES
	DT 20		300405	677118	34.7	30.1	No data	No data	12.7	16.6	16.6	22.5	24.5	27.4	28.5	32.1	NO
	DT 21		308641	667912	20.2	16.5	No data	No data	9.1	10.1	8.3	10.9	13.7	No data	No data	22.4	YES
	DT 22		308957	675025	24.5	No data	No data	No data	10.9	11	10.8	15.2	17.8	20.4	24.6	24	NO
	DT 23		309133	675028	19.6	No data	No data	No data	No data	10.2	11.1	12.8	15.6	18.9	22.3	24.8	YES

Figure C.2 - Screenshot from Bureau Veritas Diffusion Tube Annualisation Tool – Site Annualisation Factor for Broxburn

Diffusion Tube ID	Annualisation Factor Broxburn	Annualisation Factor Site 2 Name	Annualisation Factor Site 3 Name	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)	Comments
DT 1	0.9201					-	-	
DT 11	0.9852					-	-	
DT 19	0.9201					-	-	
DT 21	0.9201					-	-	
DT 23	0.8792					-	-	
						-	-	
						-	-	
						-	-	
						-	-	
						-	-	
						-	-	

... Diffusion Tube Calendar Inputs | Diffusion Tube Inputs | Continuous Monitor Inputs | Annualisation Summary | Annual Report Results Table

Table C.1 Annualisation of Diffusion Tube Data

SITE ID	Annualisation Factor	Raw Data Annual mean (µg/m^3)	Annualised Annual mean (µg/m3)
DT 1	0.92	12.8	11.8
DT 11	0.99	13.4	13.3
DT 19	0.92	13.1	12.1
DT 21	0.92	9.3	8.6
DT 23	0.88	11.3	9.9

Diffusion Tube Bias Adjustment Factors

West Lothian Council have applied both a national and local bias adjustment factor of 0.76(national) and 0.68(local) to the 2020 monitoring data for comparison. The national factor was taken from spreadsheet version 06/21 and encompasses 24 studies from across the country. Feedback following last year's Annual Progress Report, recommended that both a national and local factor be applied to the data to show the comparison. It is noted that both the national and local factors are fairly similar and therefore there is not much of a difference when either factor is applied, to the final adjusted data. The annual diffusion tube results are slightly higher with the national bias factor applied, however, even with the higher factor applied, there are no exceedances of the air quality objective. A summary of bias adjustment factors used by West Lothian Council over the past five

years is presented in Table C.2. This indicates that the NO_2 diffusion tube levels have been similar from 2016 to 2019 but as is shown, there was a reduction in levels at all of the sites in 2020.

- The co-location study was completed at Broxburn and Linlithgow.
- More than one co-location study was used to obtain a local bias factor. The calculations to determine this factor can be seen on page 37.
- For calculation of the local bias adjustment factor for the diffusion tubes the following spreadsheet was used: AEA_DifTPAN_c04.xls

Table C.2 – Bias Adjustment Factors used over the past 5 years

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local	N/A	0.68
2020	National	06/21	0.76
2019	Local	N/A	0.77
2018	Local	N/A	0.8
2017	Local	N/A	0.9
2016	Local	N/A	0.9

Figure C.3 – Screenshot of Diffusion Tube Bias Adjustment Factors Spreadsheet (DEFRA)

Diffusion Tube Bias Adjustment Factors 06/21 Issue of the Spreadsheet							
				New (06/21) Update			
Laboratory	Method	Year	Previous Number of Studies	No. Studies Added	Total No. of Studies	Factor	Change in Factor
Aberdeen Scientific Services	20% TEA in water	2020	7	0	7	0.78	0.01
Edinburgh Scientific Services	50% TEA in acetone	2020	2	3	5	0.85	-0.03
Glasgow Scientific Services	20% TEA in water	2020	10	-1	9	0.95	-0.01
Gradko	20% TEA in water	2020	18	9	27	0.81	0.00
Gradko	50% TEA in acetone	2020	14	7	21	0.83	0.01
Lambeth Scientific Services	50% TEA in acetone	2020	5	5	10	0.95	-0.01
Milton Keynes Council	20% TEA in water	2020	4	0	4	0.83	0.00
SOCOTEC Didcot	20% TEA in water	2020	6	0	6	0.74	0.00
SOCOTEC Didcot	50% TEA in acetone	2020	22	2	24	0.76	-0.01
SOCOTEC Glasgow	20% TEA in water	2020	1	0	1	0.79	0.00
SOCOTEC Glasgow	50% TEA in acetone	2020	1	0	1	0.79	0.00
Somerset County Council	20% TEA in water	2020	2	8	10	0.85	0.09
South Yorkshire Air Quality Samplers	50% TEA in acetone	2020	1	0	1	0.77	0.00
Staffordshire Scientific Services	20% TEA in water	2020	15	0	15	0.85	0.00
Tayside Scientific Services	20% TEA in water	2020	1	0	1	0.75	0.00
Number of Studies Included			**109**	**33**	**142**		

Figure C.4 – Screenshot from AEA Spreadsheet - Bias Adjustment Factors for Diffusion Tubes – Linlithgow AQ Station

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	08/01/2020	05/02/2020	34.7	34.5	23.7	31	6.3	20	15.6	20	100	Poor Precision	Good
2	05/02/2020	04/03/2020	29.7	28.0	32.5	30	2.3	8	5.6	23	17	Good	or Data Captu
3	04/03/2020	01/04/2020	18.4	18.4	18.3	18	0.1	0	0.1	17	76	Good	Good
4	01/04/2020	29/04/2020	18.4	18.4	18.3	18	0.1	0	0.1	10	100	Good	Good
5	29/04/2020	03/06/2020	13.6	13.7	13.7	14	0.1	0	0.1	10	100	Good	Good
6	03/06/2020	01/07/2020	18.6	15.4	16.2	17	1.7	10	4.1	11	100	Good	Good
7	01/07/2020	29/07/2020	15.8	16.0	14.4	15	0.9	6	2.2	11	100	Good	Good
8	29/07/2020	02/09/2020	24.2	22.4	22.6	23	1.0	4	2.5	16	99	Good	Good
9	02/09/2020	30/09/2020	25.6	26.2	23.5	25	1.4	6	3.5	18	100	Good	Good
10	30/09/2020	04/11/2020	22.0	26.2	27.7	25	3.0	12	7.3	19	62	Good	or Data Captu
11	04/11/2020	02/12/2020	29.8	30.0	31.6	30	1.0	3	2.5			Good	
12	02/12/2020	06/01/2020	33.9	35.0	34.4	34	0.6	2	1.4			Good	
13													
										Overall survey -->		Good precision	Poor Overall DC

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

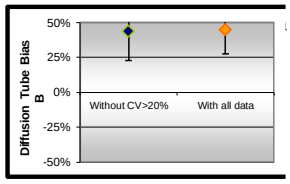
Site Name/ ID:	CM1 Linlithgow

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 7 periods of data	
Bias factor A	0.71 (0.62 - 0.83)
Bias B	41% (20% - 61%)
Diffusion Tubes Mean:	19 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	13 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	13 (12 - 15) µgm^{-3}

Precision	11 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 8 periods of data	
Bias factor A	0.7 (0.62 - 0.8)
Bias B	43% (26% - 60%)
Diffusion Tubes Mean:	20 µgm^{-3}
Mean CV (Precision):	6
Automatic Mean:	14 µgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	14 (13 - 16) µgm^{-3}

(Check average CV & DC from Accuracy calculations)



Jaume Targa, for AEA
Version 04 - February 2011

Figure C.5

Figure C.5 – Screenshot from AEA Spreadsheet - Bias Adjustment Factors for Diffusion Tubes – Broxburn AQ Station

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	08/01/2020	05/02/2020	24.9	26.5	28.3	27	1.7	6	4.2	20	100	Good	Good
2	05/02/2020	04/03/2020	36.1	31.9	36.0	35	2.4	7	6.0	23	100	Good	Good
3	04/03/2020	01/04/2020	24.4	25.8	21.6	24	2.1	9	5.3	21	100	Good	Good
4	01/04/2020	29/04/2020	24.4	25.8	21.6	24	2.1	9	5.3	13	100	Good	Good
5	29/04/2020	03/06/2020	18.1	21.6	18.3	19	2.0	10	4.9	13	97	Good	Good
6	03/06/2020	01/07/2020	25.9	25.6	21.7	24	2.3	10	5.8	14	73	Good	or Data Captu
7	01/07/2020	29/07/2020	20.6	18.0	17.5	19	1.7	9	4.1	13	52	Good	or Data Captu
8	29/07/2020	02/09/2020	30.6	29.2	27.9	29	1.4	5	3.4	20	70	Good	or Data Captu
9	02/09/2020	30/09/2020	31.6	32.3	28.5	31	2.0	7	5.0	20	100	Good	Good
10	30/09/2020	04/11/2020	39.1		37.5	38	1.1	3	10.2	21	100	Good	Good
11	04/11/2020	02/12/2020	36.5	35.4		36	0.8	2	7.0	19	100	Good	Good
12	02/12/2020	06/01/2020	41.7	43.0	39.9	42	1.6	4	3.9	28	100	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision | Good Overall DC

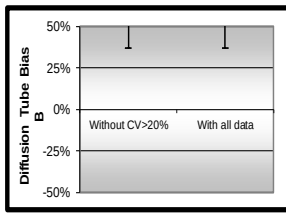
Site Name/ ID:	CM2 Broxburn

Precision: 12 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 9 periods of data	
Bias factor A	0.65 (0.58 - 0.74)
Bias B	55% (35% - 74%)
Diffusion Tubes Mean:	31 µgm^{-3}
Mean CV (Precision):	6
Automatic Mean:	20 µgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	20 (18 - 23) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 9 periods of data	
Bias factor A	0.65 (0.58 - 0.74)
Bias B	55% (35% - 74%)
Diffusion Tubes Mean:	31 µgm^{-3}
Mean CV (Precision):	6
Automatic Mean:	20 µgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	20 (18 - 23) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Table C.3 – Local Bias Correction Factor Summary

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	7	9			
Bias Factor A	0.71	0.65			
Bias Factor B	41%	55%			
Diffusion Tube Mean (µg/m^3)	19	31			
Mean CV (Precision)	4%	6%			
Automatic Mean (µg/m^3)	13.0	20.0			
Data Capture	96%	100%			
Adjusted Tube Mean (µg/m^3)	13.0	20.0			

Table C.4 – Local Bias Correction Factor Calculation

Automatic Roadside Monitoring Site	Bias B%
Linlithgow	41
Broxburn	55
Mean Bias B	48
Factor + 1	1.48
Inverse	**0.68**

Note Calculation in accordance with LAQM TG16 Chapter 7

NO_2 Fall-off with Distance from the Road

The diffusion tube NO_2 monitoring locations within West Lothian Council did not require distance correction during 2020.

QA/QC of Automatic Monitoring

- The data management and LSO duties are carried out by Technical Officer Sarah Gillespie at West Lothian Council.
- Calibrations are automatically performed daily on the NO_X analysers at each of the three automatic monitoring stations. Audits are carried out every 6 months by Ricardo AEA Technology and servicing is also carried out every 6 months by an engineer from Enviro Technology.
- Ratification of the data is carried out by Ricardo AEA, and the monitoring data presented within the APR is ratified;
- Live and historic data is currently available on the Scottish Air quality web-site. This is available at www.scottishairquality.scot.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10}/$PM_{2.5}$ monitor utilised within West Lothian Council do not require the application of a correction factor.

Automatic Monitoring Annualisation

Annulisation was required for two of our Automatic monitoring sites in West Lothian located at Linlithgow and Newton for PM_{10}, $PM_{2.5}$ and NO_2 as the data capture was less than 75%. The results are shown in Table C.4

There were various issues with data capture at the continuous monitoring sites during 2020. At Linlithgow data loss during 2020 occurred as follows:

PM10/PM2.5 – Data loss occurred from August 2020 until end of 2020 and beyond. (The FIDAS was re-installed in May 2021). There were data capture issues when a new service and maintenance contractor took over in June 2020, with data going to the Scottish AQ website disrupted. In addition to this, the AQ software was also not working.

NOx - Data loss occurred from October 2020 until the end of 2020 and beyond. Issues were found with the NOx analyser in October 2020 and it was discovered that the moly converter required to be replaced. Once this was replaced, there were still issues with the data output and further parts then required to be replaced. This was not completed during 2020.

At the Newton site, the following data capture issues occurred during 2020;

NOx - data at Newton was lost between July and November 2020 due to several issues. In July 2020 there were problems with the gas regulator for the NOx gas but this was replaced. In August 2020 a Service was carried out by the maintenance contractor and the Council was advised that the NOx analyser failed its service and a number of parts would require replacing. A further report followed during September 2020 from the maintenance contractor and the Council was advised that as so many parts required to be replaced and the plastic pipe work inside was brittle with age, the monitor was beyond economic repair. The NOx monitor was eventually sent for further investigations and a hot spare was installed at Newton at the end of October 2020. However, there continued to be problems at the site and data was flat lining. The problems finally settled during mid November 2020.

PM10/2.5 - In addition to this, there were also problems with the FIDAS monitor at the Newton site from September to November 2020. Power loss to the monitoring station

occurred and this corrupted the FIDAS unit. After repairs, the FIDAS unit was eventually reinstalled on 11 November 2020.

Annualisation has been carried out for Linlithgow and Newton for PM10, PM2.5 and NO2.

Table C.5 - Automatic Monitoring Annualisation Summary (concentrations presented in µg/m3)

Site ID	Annualisation Factor Broxburn	Annualisation Factor Edinburgh Queensferry Road	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
CM1 (NO_2)	1.09	1.09	1.09	15	16.4	
CM1 (PM_{10})	1	0.92	0.96	8	7.7	
CM1 ($PM_{2.5}$)	1.05	0.89	0.97	5	4.9	
CM3 (NO_2)	0.91	0.88	0.90	14	12.6	
CM3 (PM_{10})	1.07	0.98	1.03	11	11.3	
CM3 ($PM_{2.5}$)	1.1	0.94	1.02	8	8.2	

As described in the Technical Guidance LAQM-TG-16, annualisation is carried out when data capture is less than 75%. In order to do this, two to four nearby, long-term, continuous monitoring sites, ideally those forming part of the national network require to be identified. The data capture for each of these sites should ideally be at least 85%. These sites should be background (Urban Background, Suburban or Rural) sites to avoid any localised effects that may occur at Urban Centre, Roadside or Kerbside sites, and should, wherever possible lie within a radius of about 50 miles. If no background sites are available, and the site to be annualised is itself an Urban Centre, Roadside or Kerbside site, then it is permissible to annualise using roadside or kerbside sites rather than background sites, though this should be clearly stated in the annual report.

The next step is to obtain the annual means, **Am**, for the calendar year for these sites. Then work out the period means, **Pm**, for the period of interest (i.e. the period when data capture was poor at your own site), then calculate the ratio, **R**, of the annual mean to the period mean (**Am/Pm**) for each of the sites. Finally, calculate the average of these ratios, **Ra**. This is then the annualisation factor.

The next stage is to multiply the measured period mean concentration **M** by this annualisation factor **Ra** to give the estimate of the annualisation for 2020.

- The period mean for Linlithgow (CM1) for PM_{10} and $PM_{2.5}$ was January to July 2020 and for NO_2 was January to September 2020.

- The period mean for Newton (CM3) for PM_{10} and $PM_{2.5}$ was January to March 2020, June to August and December. The period mean for NO_2 for Newton was January to March, June and November and December 2020.
- The two sites used to calculate annualisation for Linlithgow and Newton were Broxburn and Edinburgh Queensferry Road as there was not enough data available at the 3 West Lothian sites. Edinburgh Queensferry Road is a roadside site but there were no other nearby urban background sites with data capture greater than 85% which monitor the required pollutants.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within West Lothian Council required distance correction during 2020.

Air Pollution Report

1st January to 31st December 2020

Air Quality in Scotland

West Lothian Linlithgow High Street 2 (Site ID: WLC1)

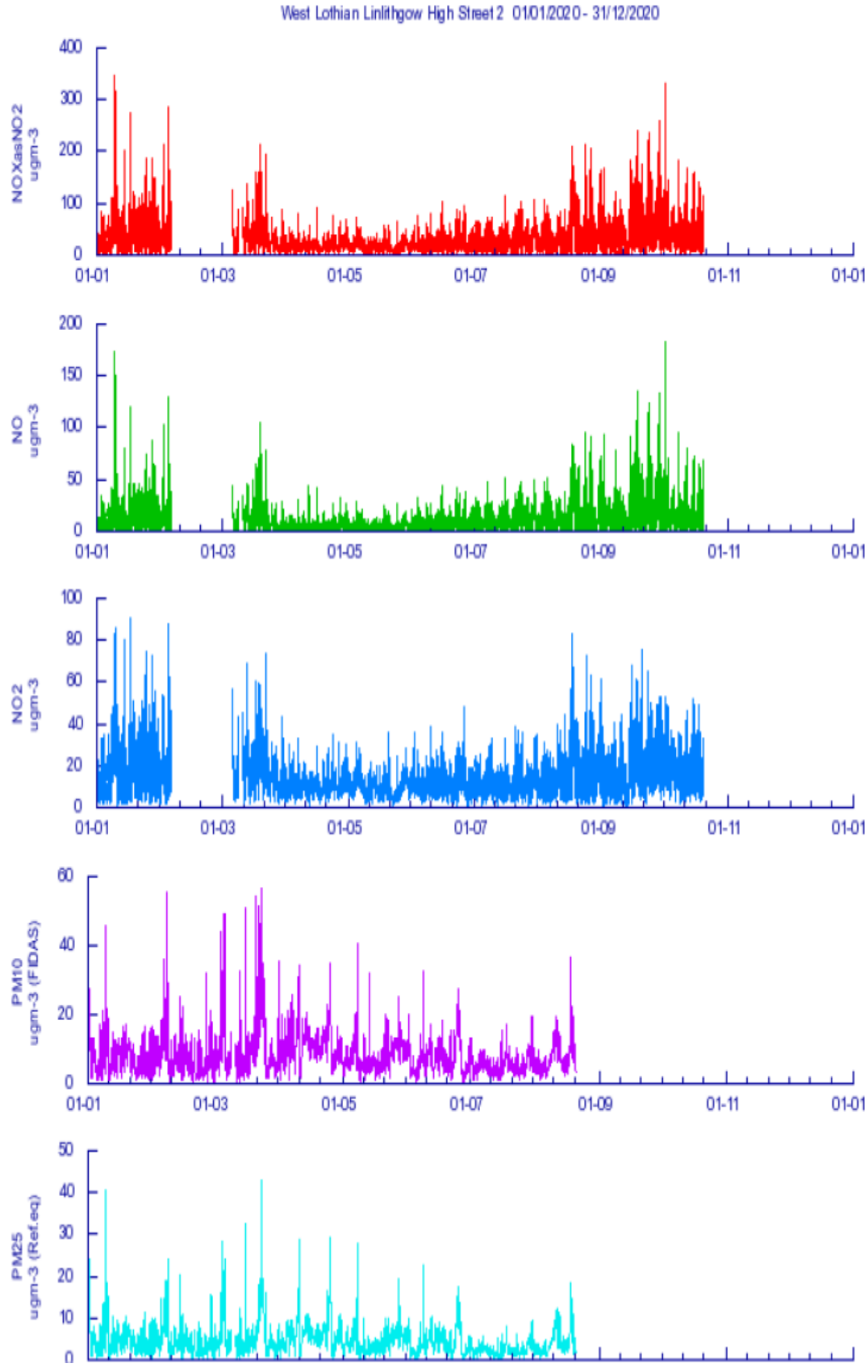
These data have been fully ratified

Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³	PM_{10} µg/m³	PM_{25} µg/m³
Number Days Low	-	265	-	230	230
Number Days Moderate	-	0	-	0	0
Number Days High	-	0	-	0	0
Number Days Very High	-	0	-	0	0
Max Daily Mean	48	43	117	27	17
Annual Max	182	91	348	57	43
Annual Mean	13	15	34	8	5
98th Percentile of daily mean	-	-	-	19	-
90th Percentile of daily mean	-	-	-	14	-
99.8th Percentile of hourly mean	-	74	-	-	-
98th Percentile of hourly mean	55	46	127	24	15
95th Percentile of hourly mean	40	37	96	19	11
50th Percentile of hourly mean	8	12	24	7	4
% Annual data capture	**71.44%**	**71.37%**	**71.37%**	**63.18%**	**63.18%**

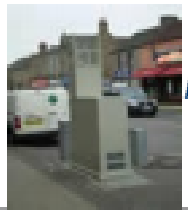
Pollutant	Air Quality Standards (Scotland) Regulations 2010	Exceedances	Days
PM10 particulate matter (Hourly measured)	daily mean > 50 microgrammes per metre cubed	0	0
PM10 particulate matter (Hourly measured)	Annual mean > 18 microgrammes per metre cubed	0	-
PM2.5 particulate matter (Hourly measured)	Annual mean > 12 microgrammes per metre cubed	0	-
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 microgrammes per metre cubed	0	-

Annual Graph



Air Pollution Report

1st January to 31st December 2020



Air Quality in Scotland

West Lothian Broxburn (Site ID: BRX)

These data have been fully ratified

Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_2 as NO_2 µg/m³	PM_{10} µg/m³	$PM_{2.5}$ µg/m³
Number Days Low	-	335	-	366	366
Number Days Moderate	-	0	-	0	0
Number Days High	-	0	-	0	0
Number Days Very High	-	0	-	0	0
Max Daily Mean	102	60	208	33	20
Annual Max	294	99	532	141	68
Annual Mean	21	19	52	11	6
98th Percentile of daily mean	-	-	-	26	-
90th Percentile of daily mean	-	-	-	18	-
99.8th Percentile of hourly mean	-	87	-	-	-
98th Percentile of hourly mean	113	61	230	32	18
95th Percentile of hourly mean	80	50	169	25	14
50th Percentile of hourly mean	12	15	34	9	5
% Annual data capture	**90.88%**	**90.87%**	**90.87%**	**99.95%**	**99.95%**

Instruments: PM_{10}: FIDAS

PM_{25}: FIDAS

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µg m-3

Note: For a strict comparison against the objectives there must be a data capture of 85% or greater throughout the calendar year.

Pollutant	Air Quality Standards (Scotland) Regulations 2010	Exceedances	Days
PM10 particulate matter (Hourly measured)	daily mean > 50 microgrammes per metre cubed	0	0
PM10 particulate matter (Hourly measured)	Annual mean > 18 microgrammes per metre cubed	0	-
0	-		
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 microgrammes per metre cubed	0	-

Air Pollution Report

1st January to 31st December 2020

Air Quality in Scotland

West Lothian Newton (Site ID: WLN4)

These data have been fully ratified

Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_X as NO_2 µg/m³	PM_{10} µg/m³	$PM_{2.5}$ µg/m³
Number Days Low	-	188	-	247	247
Number Days Moderate	-	0	-	0	0
Number Days High	-	0	-	0	0
Number Days Very High	-	0	-	0	0
Max Daily Mean	27	41	81	39	30
Annual Max	102	90	230	157	139
Annual Mean	8	14	25	11	8
98th Percentile of daily mean	-	-	-	26	-
90th Percentile of daily mean	-	-	-	19	-
99.8th Percentile of hourly mean	-	80	-	-	-
98th Percentile of hourly mean	39	54	111	50	40
95th Percentile of hourly mean	26	42	81	33	27
50th Percentile of hourly mean	5	10	17	8	4
% Annual data capture	**48.36%**	**48.36%**	**48.36%**	**68.62%**	**68.62%**

Instruments: PM_{10}: FIDAS

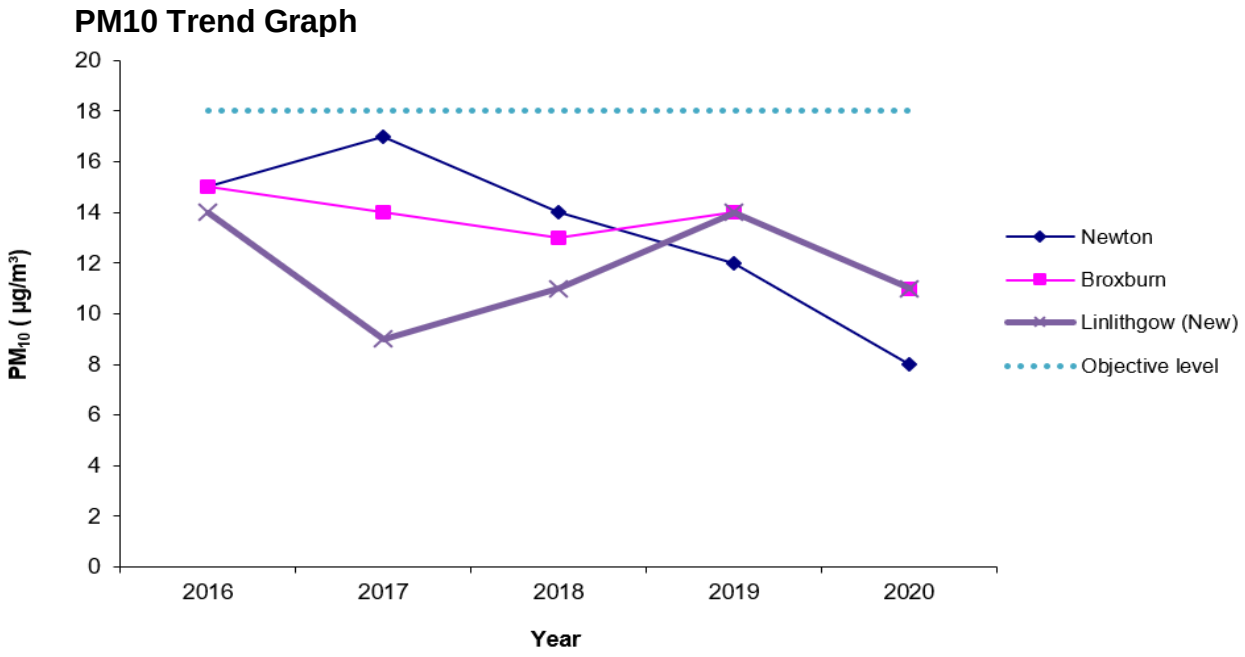
PM_{25}: FIDAS

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µg m-3

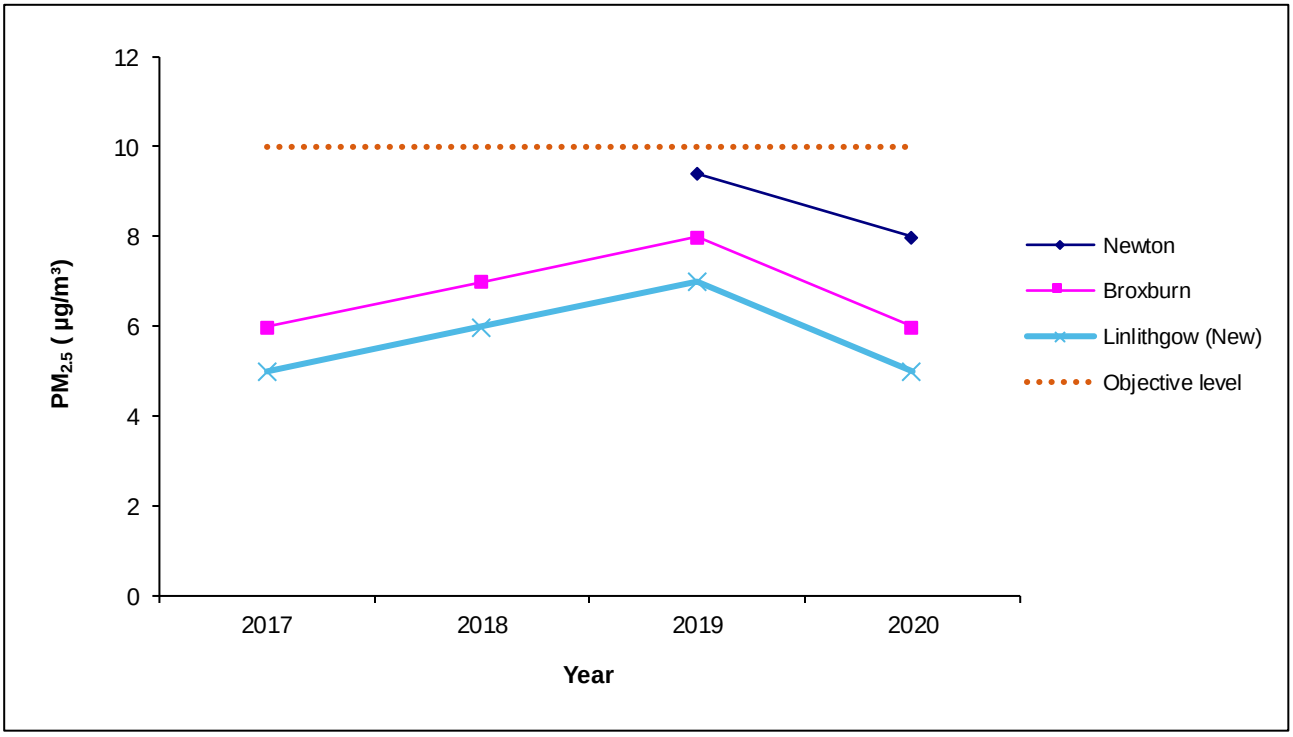
Note: For a strict comparison against the objectives there must be a data capture of 85% or greater throughout the calendar year.

Pollutant	Air Quality Standards (Scotland) Regulations 2010	Exceedances	Days
PM10 particulate matter (Hourly measured)	daily mean > 50 microgrammes per metre cubed	0	0
PM10 particulate matter (Hourly measured)	Annual mean > 18 microgrammes per metre cubed	0	-
0	-		
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 microgrammes per metre cubed	0	-

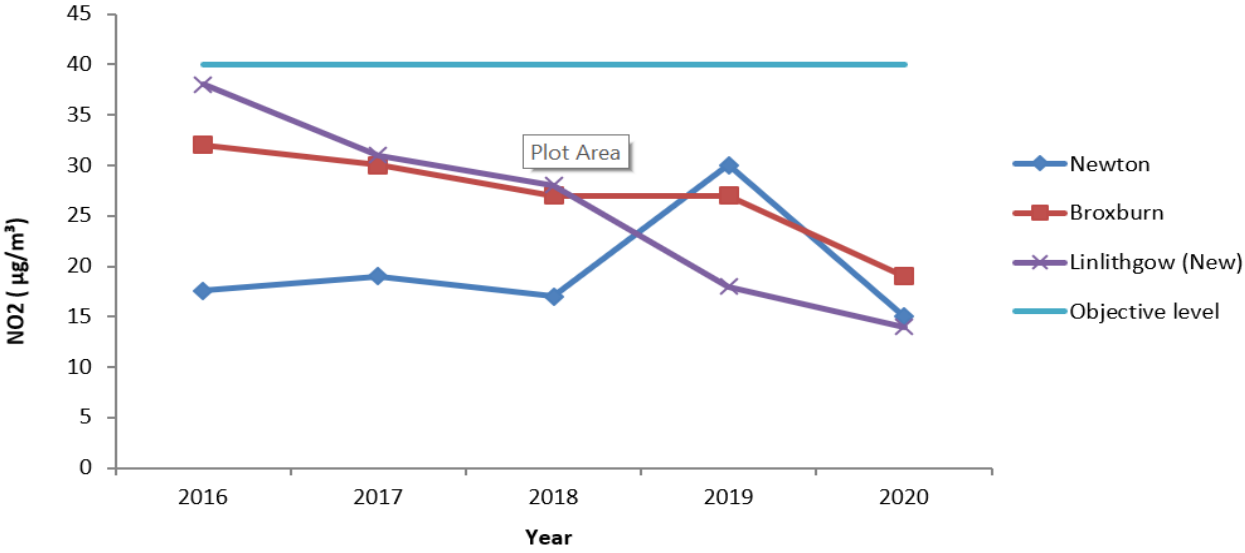
Figure C. Pollutant trend graphs over the past 5 years



PM2.5 Trend Graph

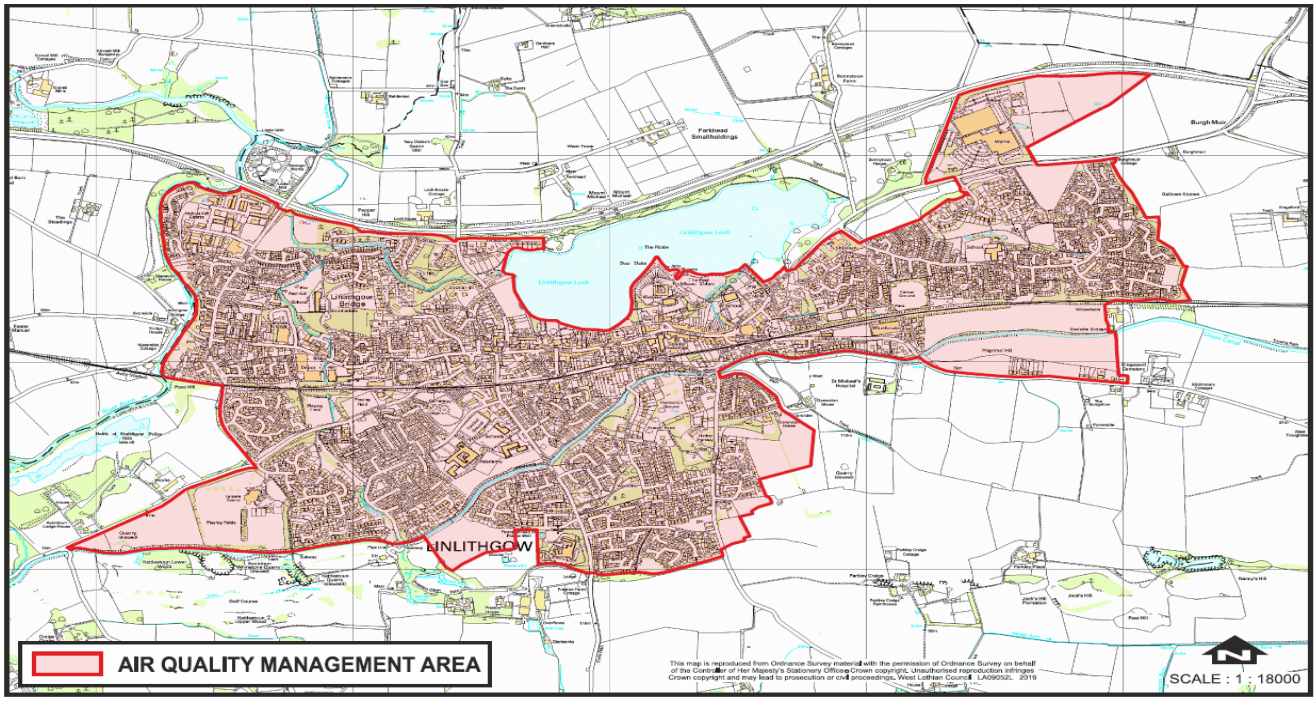


NO_2 Trend Graph

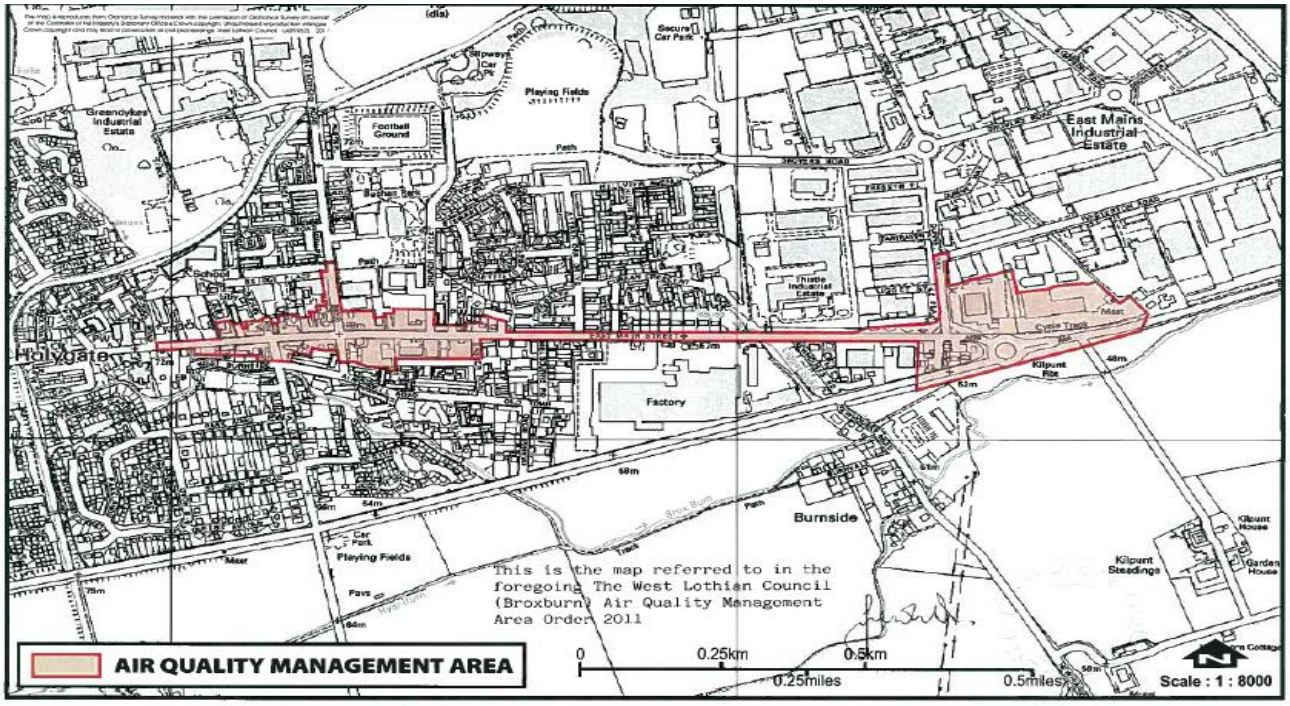


Air Quality Management Area Maps

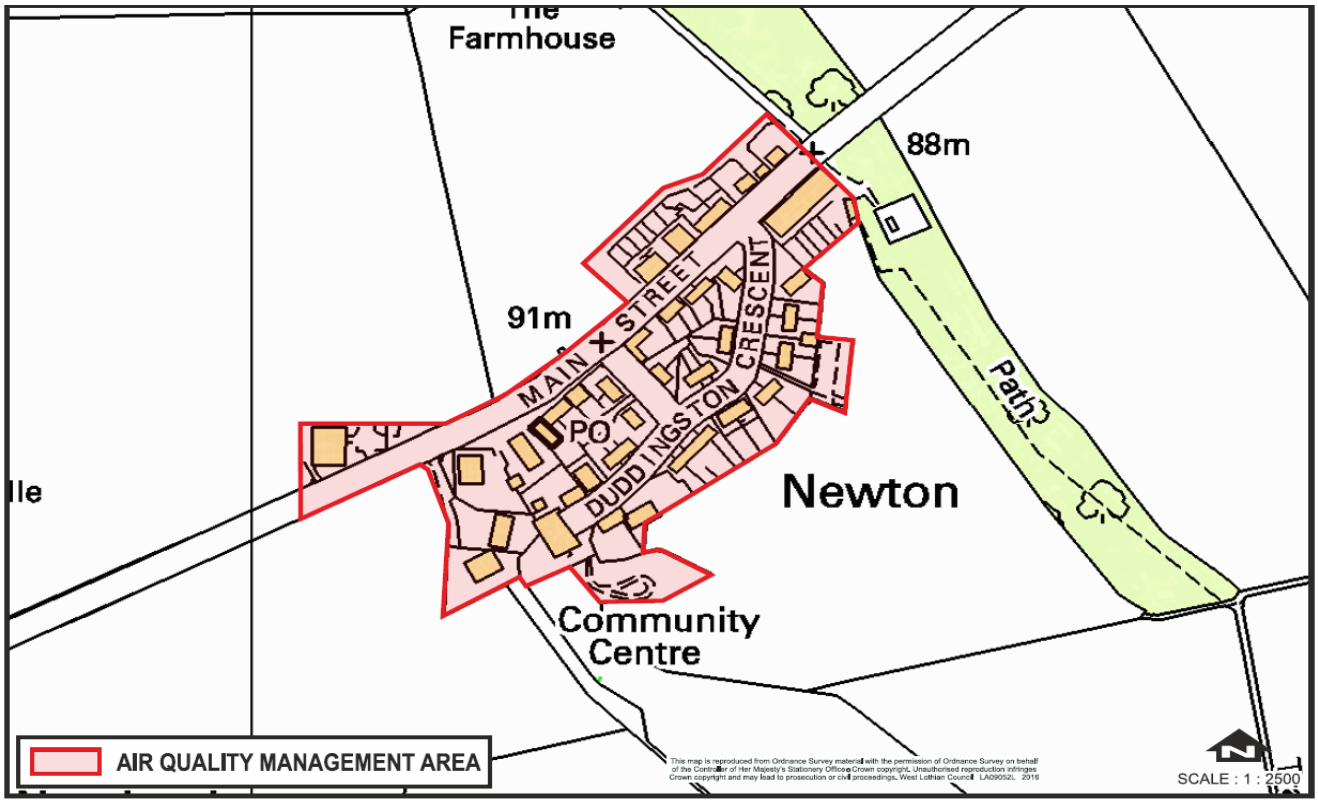
Linlithgow Air quality management area



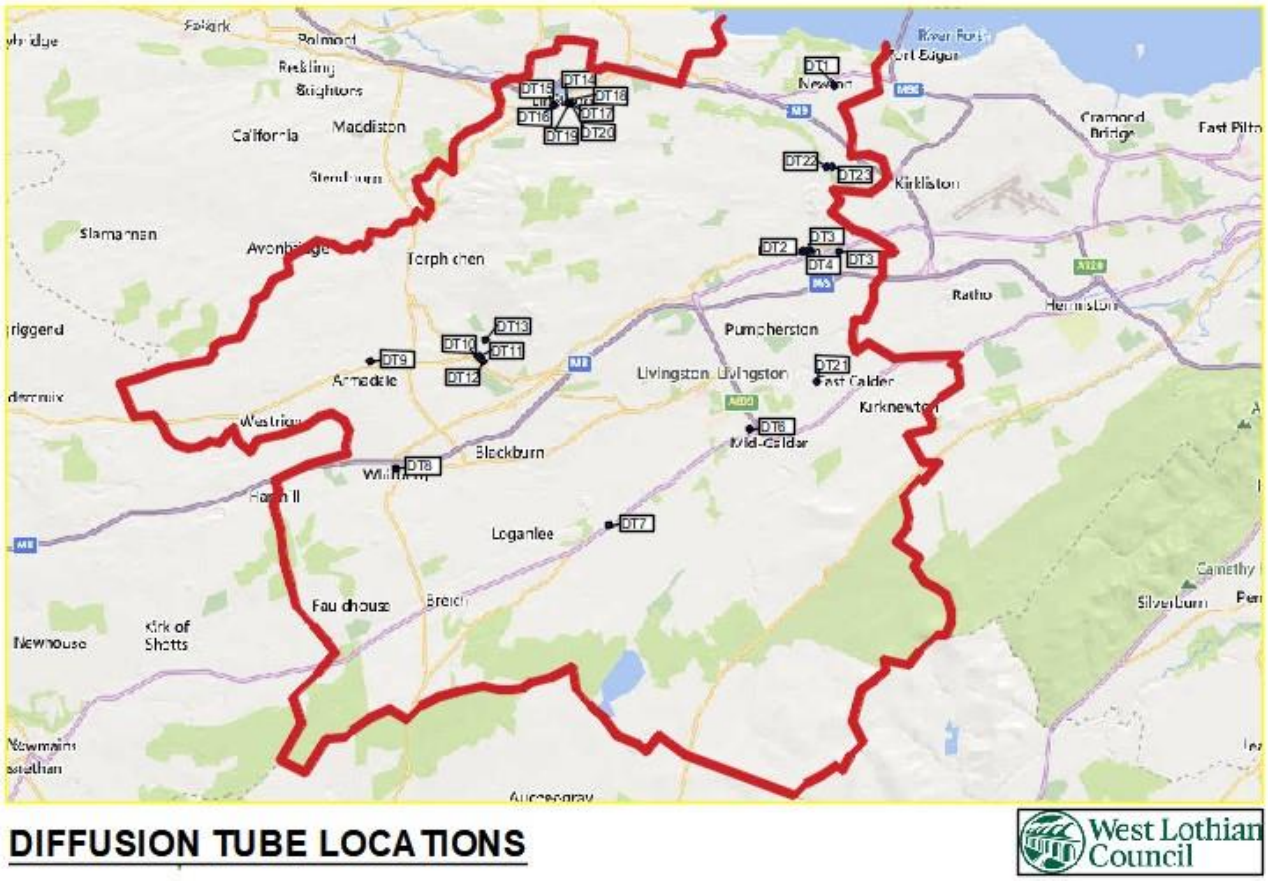
Broxburn Air quality management area



Newton Air quality management area



Diffusion Tube Locations Map



Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_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

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