



**Clackmannanshire
Council**

www.clacks.gov.uk

Comhairle Siorrachd
Chlach Mhanann

Annual Progress Report (APR)

2021 Air Quality Annual Progress Report (APR) for Clackmannanshire
Council



In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2021

Information	Clackmannanshire Council Details
Local Authority Officer	Stephen Ballantyne
Department	Development and Environmental Services
Address	Clackmannanshire Council Kilncraigs Greenside Street Alloa FK10 1EB
Telephone	01259 450000
E-mail	sballantyne@clacks.gov.uk
Report Reference Number	ITPE_4203
Date	18/10/2021

Executive Summary: Air Quality in Our Area

This report provides an overview of air quality within Clackmannanshire Council during 2020. It provides a review of pollutant monitoring data and atmospheric emissions sources within Clackmannanshire and compares the available monitoring data to national air quality standards in accordance with the guidance in LAQM.TG (16) Technical Guidance.

Air Quality in Clackmannanshire Council

There are no Air Quality Management Areas in Clackmannanshire Council.

The Council continued to monitor concentrations of NO₂, PM₁₀ and PM_{2.5} to determine if any air quality objectives were exceeded during 2020. The Council operated two continuous automatic monitoring sites during 2020 – one located at King Street (Site ID CM1) and one located at Hallpark Road in Alloa (AQ Mesh pod).

The chemiluminescent monitor at the automatic monitoring station at King Street (Site ID CM1) recorded an annual mean concentration of NO₂ of 19 µg/m³, a decrease from the monitored concentration of 22 µg/m³ in 2019. Results for the annual mean concentration of NO₂ from CM1 have been in the range 19 - 29.3µg/m³ over the last five years.

The AQ Mesh pod installed at Hallpark Road in Alloa recorded an annual mean NO₂ concentration of 14.6 µg/m³ for 2020, a decrease from the monitored concentration of 15.2µg/m³ in 2019. Results for the annual mean concentration of NO₂ from the AQ Mesh pod have been in the range 15.2 – 43 µg/m³ over the last four years (the pod was installed in 2017). A non-automatic passive diffusion tube site (ID DT7) is located close by to the AQ Mesh pod, on Pearson View, Sauchie. DT7 recorded an annual mean NO₂ concentration of 11.8 for 2020.

Both automatic monitoring sites recorded NO₂ concentrations below the air quality objectives for 2020.

The Council also operated a network of six non-automatic passive diffusion tubes to monitor ambient concentrations of NO₂ throughout 2020. All monitored concentrations were found to be below the air quality objectives.

All diffusion tube sites show a significant decrease in monitored annual mean concentrations in 2020 compared to 2019. This is highly likely due to the government enforced lockdowns in 2020 due to the Covid-19 pandemic.

Examination of the previous five years of data show there to be no obvious trend in annual mean NO₂ concentrations across the diffusion tube network.

The FIDAS monitors located at automatic monitoring site CM1 monitored annual mean concentrations of 9 µg/m³ and 5 µg/m³ for PM₁₀ and PM_{2.5} respectively during 2020. Results for the annual mean concentrations of PM₁₀ from CM1 have been in the range of 9 – 13 µg/m³ over the last five years. Results for the annual mean concentrations of PM_{2.5} from CM1 have been in the range of 5 – 6 µg/m³ over the last three years.

The AQ Mesh pod installed at Hallpark Road in Alloa recorded annual mean concentrations of 3.9 µg/m³ and 2 µg/m³ for PM₁₀ and PM_{2.5} respectively in 2020. Results for the annual mean concentrations of PM₁₀ and PM_{2.5} from the AQ Mesh pod have been in the range of 3.9 – 9.2 µg/m³ and 2 – 3.9 µg/m³ over the last four years, respectively.

Both automatic monitoring sites recorded PM₁₀ and PM_{2.5} concentrations below the air quality objectives for 2020.

A review of planning applications submitted in 2020 showed there are two newly proposed developments within Clackmannanshire Council which could potentially impact on local air quality.

One of these developments is a proposed residential development at Schawpark Golf Course, Main Street, Sauchie. Planning permission was approved for this development in 2020. No air quality assessment was requested or submitted as part of the planning application.

The second development is a proposed gas peaking power plant at Land South of Hennings Wood, Collyland Road, Fishcross. An air quality assessment has been submitted for this development as part of the planning application. The planning application has not yet been determined.

Clackmannanshire Council Roads and Transportation confirmed there were no new roads constructed with the potential to result in an exceedance of the AQS objectives. Traffic counts on roads within Clackmannanshire were not available for 2020 at the time of writing

this APR. Traffic counts from 2017 and 2018 are therefore presented in this report similar to last years report. These counts would give a better representation of traffic numbers which would have been expected on the local road network during 2020 if Covid-19 lockdown and restrictions had not been in place.

Actions to Improve Air Quality

There are currently no Air Quality Management Areas (AQMAs) or action plans in the Clackmannanshire area, however the annual progress report summarises potential increases in emissions which may adversely affect air quality (like new roads or commercial developments). Where potential air pollution ‘hotspots’ are considered likely, monitoring will be considered for those areas.

The Council continues to:

- monitor the ambient concentration of PM_{2.5}, PM₁₀ and NO₂ in the Alloa area, including additional monitoring at Hallpark Road;
- promote sustainable travel alternatives (walking and cycling) through the Local Active Travel Strategy, the promotion of cycle routes, and the introduction of travel plans and cycle/walk to work initiatives and investment in technology to allow video conferencing;
- reduce the number of vehicles in the Council fleet and replace older inefficient vehicles with low emissions alternatives when funding is available;
- promote low emission transport (installation of electric charging points); and
- review and develop policies which impact on air quality.

Local Priorities and Challenges

The Council is committed to continuing the review and assessment of pollutants affecting the air quality in Clackmannanshire. The priority is to continue monitoring concentrations of NO₂, PM₁₀ and PM_{2.5}, and widen the area of coverage of the monitoring network by utilising the AQ Mesh monitor, however this will remain at Hallpark Road during 2021.

Roads and Transportation will continue with plans for the promotion of low emission transport and sustainable travel alternatives as identified in the Local Transport Strategy. Continued consideration to be given to the 'Cleaner Air for Scotland Strategy' and the formation of an officer group to identify any required changes to policy and current working practices in relation to Air Quality across the Council.

How to Get Involved

Improving air quality in Clackmannanshire is not only the responsibility of the Council. There are many ways members of the public, local businesses, logistics companies and transport operators can get involved. Choosing to walk or cycle instead of using the car, car sharing, and buying 'hybrid' or lower emission vehicles will all play a part in reducing pollutant levels in the area. Careful consideration should also be given to the installation/use of biomass systems and domestic wood or multi-fuel stoves as they have the potential to contribute to increased concentrations of gases and particulate matter in the air. Further information on such appliances is available on the Council website at <http://www.clacksweb.org.uk/environment/woodburningstoves/>.

The public can engage with the Council's efforts by logging onto the www.Clacksweb.org.uk website and searching for air quality. Monitoring results for the Clackmannanshire area can be viewed by visiting www.scottishairquality.co.uk and typing in your postcode. On this website, there is also the option to register for air quality alerts using the 'Know and Respond' System.

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Clackmannanshire Council	i
Actions to Improve Air Quality	iii
Local Priorities and Challenges	iii
How to Get Involved	iv
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
Air Quality Management Areas	2
Cleaner Air for Scotland	2
2.1.1 Transport – Avoiding Travel – T1	2
2.1.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2	3
Progress and Impacts of Measures to address Air Quality in Clackmannanshire Council	4
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives	6
Summary of Monitoring Undertaken	6
3.1.1 Automatic Monitoring Sites	6
3.1.2 Non-Automatic Monitoring Sites	6
Individual Pollutants	6
3.1.3 Nitrogen Dioxide (NO ₂)	6
3.1.4 Particulate Matter (PM ₁₀)	7
3.1.5 Particulate Matter (PM _{2.5})	7
3.1.6 Sulphur Dioxide (SO ₂)	8
3.1.7 Carbon Monoxide, Lead and 1,3-Butadiene	8
4 New Local Developments	9
Road Traffic Sources	9
Other Transport Sources	14
Industrial Sources	14
Commercial and Domestic Sources	14
New Developments with Fugitive or Uncontrolled Sources	15

5	Planning Applications	16
6	Impact of COVID-19 upon LAQM	19
7	Conclusions and Proposed Actions	20
	Conclusions from New Monitoring Data.....	20
	Conclusions relating to New Local Developments	20
	Proposed Actions	20
	Appendix A: Monitoring Results	21
	Appendix B: Full Monthly Diffusion Tube Results for 2020	31
	Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	32
	New or Changed Sources Identified Within Clackmannanshire Council During 2020	32
	Additional Air Quality Works Undertaken by Clackmannanshire Council During 2020	32
	QA/QC of Diffusion Tube Monitoring	32
	Diffusion Tube Annualisation.....	33
	Diffusion Tube Bias Adjustment Factors	33
	NO ₂ Fall-off with Distance from the Road.....	34
	QA/QC of Automatic Monitoring	35
	PM ₁₀ and PM _{2.5} Monitoring Adjustment	40
	Automatic Monitoring Annualisation	40
	NO ₂ Fall-off with Distance from the Road.....	40
	Glossary of Terms	41
	References	42

List of Tables

Table 1.1 – Summary of Air Quality Objectives in Scotland.....	1
Table 2.2 – Progress on Measures to Improve Air Quality.....	5
Table A.1 – Details of Automatic Monitoring Sites	22
Table A.2 – Details of Non-Automatic Monitoring Sites	23
Table A.3 – Annual Mean NO ₂ Monitoring Results (µg/m ³)	25
Table A.4 – 1-Hour Mean NO ₂ Monitoring Results, Number of 1-Hour Means > 200µg/m ³	27
Table A.5 – Annual Mean PM ₁₀ Monitoring Results (µg/m ³)	28
Table A.6 – 24-Hour Mean PM ₁₀ Monitoring Results, Number of PM ₁₀ 24-Hour Means > 50µg/m ³	29
Table A.7 – Annual Mean PM _{2.5} Monitoring Results (µg/m ³)	30
Table B.1 – NO ₂ 2020 Monthly Diffusion Tube Results (µg/m ³).....	31
Table C.1 – Bias Adjustment Factor	34

List of Figures

Figure A.1 – Air Quality Monitoring Locations Within Clackmannanshire

1 Local Air Quality Management

This report provides an overview of air quality in Clackmannanshire Council 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 Clackmannanshire 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

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.

Clackmannanshire Council currently does not have any AQMAs. There are no recommendations in this year's report to declare any new AQMAs in the Council area.

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 Clackmannanshire 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. Clackmannanshire Council has developed a revised Local Transport Strategy for up to 2019 which has not yet been formally adopted or updated. The results of the public consultation of the new Transport Strategy are available to view on the Council website <https://www.clacks.gov.uk/transport/localtransportstrategy/>. The Council are now considering the preparation of a revision to the 2019 strategy to account for any impacts or changes associated with the Covid-19 pandemic. It is expected that all the aims and objectives of the strategy will however be relatively the same.

In the interim period, the existing strategy for 2010-2014 will remain valid for use. Public transport plays an important part in the Council's transport strategy.

The Public Transport Unit operates jointly with Stirling Council. The Public Transport Unit also jointly works on public transport initiatives Falkirk Council. An example of one of the recently formed collaborative initiatives is the Forth Valley Bus Alliance.

The Council continues to work with “Sustrans”, “Cycling Scotland” and “Paths for All” to deliver and promote our Active Travel Network and have published a leaflet for members of the public “Get Active-Go Green”, available for download from <https://www.clacks.gov.uk/document/2538.pdf>.

Clackmannanshire Council promote a Cycle to Work scheme aimed at reducing congestion and pollution by encouraging staff cycle to and from work. The scheme proved to increase in popularity during 2020.

The Council also normally operate a trip-share scheme encouraging staff to car share on journeys to and from work. Due to the Covid-19 pandemic and government guidance not to share transport however, this scheme is currently not being actively promoted.

The Council web site (<https://www.clacks.gov.uk/transport/travelplans/>) provides a summary of existing Council Travel Plans and advice to existing businesses and new developments on measures for inclusion in travel plans aimed at reducing journeys by car.

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. Clackmannanshire Council has a Sustainability and Climate Change Strategy (<https://www.clacks.gov.uk/document/2858.pdf>) which includes replacing vehicles with the latest engine specifications and providing training to reduce fleet vehicle fuel-use through fuel efficient driver training programmes. Additionally, lighting, heating and other electrical upgrades in council buildings are expected to have led to reduced energy consumption and therefore atmospheric emissions.

An in-depth review of the Sustainability and Climate Change Strategy by the Council was to be carried out in 2019/2020 however was delayed due to the Covid-19 pandemic. The Council does plan however to undertake an in-depth review at a later date.

Clackmannanshire Council's latest annual statement report on climate change (<https://sustainableScotlandNetwork.org/reports/clackmannanshire-council>) is for the year

2019. The report demonstrates that greenhouse gas emissions reduced from 6,285 tCO₂e in 2018/19 to 5,986 tCO₂e in 2019/20.

Progress and Impacts of Measures to address Air Quality in Clackmannanshire Council

Clackmannanshire 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 2.1. More detail on these measures are set out in Table 2.1.

Progress on the following measures has been slower than expected due to the government enforced Covid-19 retractions:

- TripShare Clacks – car share for council staff members

Table 2.1 – 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	Control of new developments	Policy Guidance and development control	Continue to monitor concentrations of pollutants in the Council area	Development and Environment	Ongoing	Ongoing	Monitored emissions	N/A, no AQMAs	Satisfactory	Ongoing	New developments will continue to be monitored and where necessary action will be taken
2	Mobile emissions monitor installed at A908 Hallpark Road, Sauchie where it was identified that traffic levels had increased.	Transport planning and infrastructure	Monitoring of PM _{2.5} , PM ₁₀ and NO _x levels using this equipment.	Development and Environment	Funding has been awarded	Autumn 2017.	Comparison with AQOs	N/A, no AQMAs	Monitoring since June 2017	Continue Monitoring to at least to end of 2021 at this location	Annual Mean NO ₂ below AQO
3	Relocate DT1 from Norwood Place to DT7 Pearson View (façade on Hallpark Road) for co-location with AQ Mesh	Transport planning and infrastructure	Monitoring of NO ₂ at sensitive receptor with passive sampling to verify AQ Mesh	Development and Environment	Complete	Complete	Comparison with AQOs and AQ Mesh measurements	N/A, no AQMAs	Monitoring since August 2019	Continue Monitoring to at least to end of 2021 at this location	2020 monitored NO ₂ annual mean below AQO
4	Environmental Health work closely with other departments of the Council such as roads and transportation, fleet management, development planning, sustainability and planning policy	Policy guidance and development control	Advice set out in the Cleaner Air for Scotland strategy (CAFS)	Development and Environment	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing upgrades to low emissions vehicles when funding allows and retirement of older stock.	Ongoing	
5	Upgrades to fleet vehicles used by Council staff	Promoting low emission transport	Electric car charging points	Development and Environment	Complete	Complete	None	N/A, no AQMAs	Fleet of electric vehicles in council has now grown to 31. 14 of these are pool vehicles. Aim to continue year on year growth of electric vehicles in fleet.	Ongoing	
6	Increase in number of electric vehicle charging bays within Clackmannanshire	Promoting low emission transport	Details of active sites available at https://www.clacks.gov.uk/environment/charging-points/	Development and Environment	Complete	Complete	None	N/A, no AQMAs	A total of 17 charging bays are now available to the public. A further 12 are in progress of being installed.	Ongoing	Electric vehicle charging bays within Clackmannanshire not owned by the council also available to the public, such as those at Forth Valley College. Locations can be found on ChargePlace Scotland website https://chargeplacescotland.org/live-map/
7	Promotion of walking and cycling. Part of this is the Smarter Choices, Smaller Places initiative which is promoted to the public and introduction of the Walk Once a Week (WOW) initiative into local schools	Alternative to Private vehicle use	Local Active Travel strategy	Development and Environment	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing. Installation of Forth Bike electric bike hire stations at Alloa Train Station, Strathdevon Primary School and Devon Way on Moss Road.	Ongoing	
8	Council utilises the TripShare Clacks website aimed at reducing congestion and pollution by encouraging staff to car share on journeys to and from work	Promoting travel alternatives	Car sharing	Development and Environment	Ongoing	Ongoing	No of shared journeys/teams	N/A, no AQMAs	10 Active Car Sharing Teams	Paused due to Covid-19 Restrictions	
9	Council has invested in technology in an effort to reduce car journeys for meetings	Promoting travel alternatives	Video and telephone conferencing	Information Technology	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing	Ongoing	Expected to increase post Covid-19 restrictions due to increased home working
10	Cycle to work scheme for staff is promoted by the Council	Promoting travel alternatives	Cycle to work scheme	Development and Environment (Transportation)	Ongoing	Ongoing	None	N/A, no AQMAs	Ongoing	Ongoing	
11	Continue PM _{2.5} /PM ₁₀ continuous analyser at King Street, Alloa site	Policy Guidance and development control	To obtain data for this statutory pollutant with accredited equipment and analyser	Development and Environment	Complete	Complete	Monitored emissions	N/A, no AQMAs	Installed Dec 17	Ongoing	Forth full year of PM monitoring data included in this report

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.

Clackmannanshire Council undertook automatic (continuous) monitoring at two 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/>.

A map showing the location of the monitoring sites is provided in Appendix A – Figure A.1. 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

Clackmannanshire Council undertook non- automatic (passive) monitoring of NO₂ at six sites during 2020. Table A.2 in Appendix A shows the details of the sites.

A map showing the location of the monitoring sites is provided in Appendix A – Figure A.1. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

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.

3.1.3 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40 µg/m³.

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

There were no exceedances of the NO₂ annual mean objective in 2020.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past five years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

There have been no exceedances of the hourly mean NO₂ objective recorded at either of the automatic sites (CM1 or AQ Mesh pod).

There are no annual means of NO₂ greater than 60µg/m³ at any of the passive diffusion tube sites which would indicate that an exceedance of the 1 hour mean objective is unlikely at these sites.

No AQMA requires to be declared with regard to NO₂ levels in Clackmannanshire.

3.1.4 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past five years with the air quality objective of 18µg/m³.

There were no exceedances of the PM₁₀ annual mean objective in 2020.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past five years with the air quality objective of 50µg/m³, not to be exceeded more than seven times per year.

There have been no exceedances of the daily mean objective for PM₁₀ of 50µg/m³ at either of the automatic sites (CM1 or AQ Mesh pod).

No AQMA requires to be declared with regard to PM₁₀ levels in Clackmannanshire.

3.1.5 Particulate Matter (PM_{2.5})

Table A.7 in Appendix A compares the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past five years with the air quality objective of 10µg/m³.

There were no exceedances of the PM_{2.5} annual mean objective in 2020.

No AQMA requires to be declared with regard to PM_{2.5} levels in Clackmannanshire.

3.1.6 Sulphur Dioxide (SO₂)

Concentrations of SO₂ are not monitored in the Clackmannanshire Council area and there are no immediate plans to do so.

No AQMA requires to be declared with regard to SO₂ levels in Clackmannanshire.

3.1.7 Carbon Monoxide, Lead and 1,3-Butadiene

Concentrations of carbon monoxide lead and 1,3-Butadiene are not monitored in the Clackmannanshire Council area and there are no immediate plans to do so.

No AQMA currently requires to be declared with regard to Carbon Monoxide, Lead and 1,3-Butadiene in Clackmannanshire.

4 New Local Developments

The following section has been completed based on consultation with other relevant Council services and departments including Roads & Transportation and Development Control.

Road Traffic Sources

The Transport Planning Department of Clackmannanshire Council was consulted in order to check if there were any new potential road traffic sources or significantly changed traffic sources within the Council area that could result in exceedances of air quality standards.

There were no new roads introduced within Clackmannanshire during 2020.

The Transport Planning Department did however confirm that there were road closures introduced in 2020 within Alloa Town Centre as part of the Spaces for People initiative for Covid-19. These restrictions are ongoing:

- High Street and Mill Street, closed to all vehicles between 9am and 6pm with exception for deliveries and adapted disabled vehicles
- East Vennel and Candle Riggs, closed to all vehicles
- Candleriggs Car Park, closed to all vehicles with exceptions for delivery vehicles and blue badge holders.

A map of the above road closures is available to view here:

<https://www.clacks.gov.uk/document/6311.pdf>

The effect of limiting traffic through these particular roads/areas will be a decrease in air pollutant concentrations at these locations.

The Council operates 41 traffic counters within its administrative area. At the time of writing this report, the latest data available were traffic counts from the years 2017 and 2018.

Due to the national Covid-19 lockdown and restrictions which were put in place during 2020, any traffic counts recorded during this period are expected to be significantly lower than normal. The previously recorded counts for 2017 and 2018 are therefore considered to be more representative of actual traffic numbers which would be experienced if no lockdown and restrictions were in place.

Traffic count figures for 2017 – 2018 are summarised in Table 4.1.

Out of the 41 sites operated by the Council, 2018 data was only available for 12 sites. Of these data, 4 could be compared to 2017 values; 2 showed an increase in vehicle movements, and 2 showed a decrease, all changes being less than 10%. Therefore, it is concluded that there are no roads with a significant increase in traffic numbers which could affect air quality within Clackmannanshire.

Table 4.1 Summary of Traffic Survey Data: 2017 – 2018

Link	Description	Speed limit (mph)	Annual Average Daily Traffic (vehicles per day)		
			2017	2018	% change 2017-2018
00000049	A977 Gartlove (loop)	60	7706	-	
00000287	A907 Blackgrange (loop)	60	21169	-	
00000288	A907 Cambus (loop)	40	-	-	
00000289	A907 Redwell Primary School	20/30	8602	-	
00000292	A907 Ring Road Westbound (loop)	30	11203	-	
00000295	A907 Clackmannan Bypass (loop)	60	-	-	
00000299	A908 Hallpark Road	30	18684	-	
00000300	A908 Fishcross Primary School (loop)	30	-	-	
00000301	A908 Blackfaulds (loop)	40	9213	-	
00000302	A908 Alexandra Street, Devonside (loop)	30	-	-	
00000309	A91 Menstrie Mains (loop)	60	7975	-	
00000311	A91 between Menstrie & Alva (loop)	60	8127	-	
00000314	A91 West of Lower Mill Street, Tillicoultry (loop)	30	6207	-	
00000317	A91 Tait's Tomb (loop)	60	5489	-	

Link	Description	Speed limit (mph)	Annual Average Daily Traffic (vehicles per day)		
			2017	2018	% change 2017-2018
00000321	A91 Muckhart (loop)	60	3372	-	
00000501	A977 Blairingone (loop)	60	6232	-	
00000581	B908 Fairfield (loop)	30	7393	-	
00000586	B909 Hilton Road (loop)	40	12002	-	
00000589	B9096 Tullibody Sign (loop)	30	9477	-	
00000590	B9096 Tullibody Road (loop)	30	11902	-	
00000625	B9140 Tullibody Bypass (loop)	60	8357	-	
00000626	B9140 Muirside (loop)	60	9848	-	
00000634	B9140 Sheardale (loop)	60	1870	-	
00001292	A907 Ring Road Eastbound (loop)	30	9790	-	
00005891	B9096 Tullibody Road, Alloa @ Gavin's Road	30	-	9079	
58800001	B9096 Alloa Road, Tullibody @ No. 33	30	8890	8565	-3.8%
L1044	Carsebridge Road, Alloa @ No. 8	30	-	730	
75400001	Port Street, Clackmannan @ No. 11	20	1255	1191	-5.4%
10460000	North Street, Clackmannan opp No. 3	20	311	341	8.8%

Link	Description	Speed limit (mph)	Annual Average Daily Traffic (vehicles per day)		
			2017	2018	% change 2017-2018
76600000	Main Street, Clackmannan @ No. 32	20	1130	-	
93500000	South Pilmuir Street, Clackmannan opp No. 29	20	940	948	0.8%
L982	Lochies Road, Clackmannan opp No.26	20	-	-	
L868	Castle Street, Clackmannan @ No.36	20	-	-	
31000001	A91 Main Street, Menstrie @ Petrol Station	30	-	7289	
7660001	Cattlemarket, Clackmannan @ No.34	20	-	1052	
95200000	Beaucherc Street, Alva opp. No.24	20	-	481	
L871	Claremont, Alloa @ No.20	20	-	-	
L302	Alexandria Street, Devonside	30	-	-	
L1048	Birch Grove, Menstrie btw No.5/7	20	-	339	
30300000	Moss Road, Tillicoultry opp No 6/8	30	-	7163	
76700000	Alloa Road, Clackmannan @ No.62 (during bypass closure w/b, 20mph limit in place)	20	-	10093	

Other Transport Sources

Clackmannanshire Council can confirm that there are none of the following new or significantly changed transport sources:

- 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 exposure within 30m; and
- ports for shipping.

There is one train station within the Clackmannanshire Council area at Alloa which has been assessed in previous rounds of Review and Assessment for the potential impact from stationary trains. The electrification of the Stirling/Alloa/Dunblane lines was completed in 2018 and there is no longer any diesel freight utilising this route.

No further assessment of rail emissions was therefore undertaken.

In August 2020, Network Rail advised nearby local residents to the railway boundary between Alloa Station and the former Longannet Power Station that ground investigation works were to be carried out in 2020. The purpose of the works is to help define a programme of enhancements which are to be made to the railway in this area. No further details of exact railway enhancements or changes are known at time of writing this APR.

Industrial Sources

There are no new industrial sites proposed or installed within Clackmannanshire Council area during 2020 which could have an effect on local air quality.

Commercial and Domestic Sources

Clackmannanshire Council's Environmental Health Department and Planning Department were consulted on any new commercial and domestic emission sources within the Council area.

Commercial Emission Sources:

20/00220/FULL Proposed Gas Peaking Power Plant – Fishcross: See details in Table 5.1.

Domestic Emission Sources:

Previous reports concluded that there were no areas of domestic solid fuel burning with a density greater than 100 houses within a 500 x 500m area. There have been no new areas of development with significant solid fuel burning and it is therefore not necessary to undertake any further assessment.

The Council has received some complaints over the last few years regarding smoke from small, domestic wood burning stoves which are investigated on a case-by-case basis. Such installations do not always require planning permission and it is therefore difficult to track their numbers within the Council area. However, it is the intention of Clackmannanshire Council to log all complaints as they become aware of them to monitor density.

New Developments with Fugitive or Uncontrolled Sources

Clackmannanshire Council confirms that there are none of the following new or significantly changed fugitive or uncontrolled sources:

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

5 Planning Applications

The Development and Planning section of the Council was consulted with regard to major planning applications during 2020 which might affect air quality.

The applications and outcomes are summarised in Table 5.1.

A review of planning applications of new/proposed developments within other council administrative areas which could have an effect on Clackmannanshire air quality was also carried out.

Within Stirling Council, a planning application for a proposed river source heat pump and accompanying infrastructure was submitted for the land at Bandeath Industrial Estate (reference 19/01002/FUL). An air quality assessment was carried out as part of the planning application for this site, which considered potential impacts at locations within Clackmannanshire. The assessment concluded no significant impacts on the Clackmannanshire areas as a result of the development. The planning application is yet to be determined by Stirling Council. More details of the planning application for this site can be found on the Stirling Council website below: <https://pabs.stirling.gov.uk/online-applications/search.do?action=simple&searchType=Application>.

Table 5.1 – Details of Planning Applications Requiring Air Quality Assessments or Screening Assessments by Clackmannanshire Council

Name of Establishment	Data Submitted by Applicant	Assessment	Outcome
<p>18/00283/PPP Mixed Use Development Comprising Residential, Employment, Commercial and Community Uses, Sports Hall, Sports Pitches And Running Track, Including Associated Landscaping And Supporting Infrastructure On Agricultural Land And Playing Fields Land South Of Dollar Clackmannanshire</p>	<p>Application Validated 18th December 2018 – Awaiting Decision</p>	<p>AQ Assessment Requested – There are 70+ objections to the proposals and increased congestion envisaged due to 300+ homes and new school. The Roads & Transportation Department have raised concerns about the assumptions made in the Transport Assessment and SEPA have raised concerns about flood risk. A revised Masterplan and Design and Access Statement has been submitted in August 2020</p>	<p>No AQIA yet received</p>
<p>19/00272/FULL Erection of 67 houses, Stables/livery building with associated parking, formation of 6 serviced plots for houses with equestrian related use, change of use of agricultural land to paddock, construction of roads, bridge, parking, SUDS and treatment plant, Landscaping and associated works at Former Solsgirth Mine Site, Dollar</p>	<p>Application Received 21st November 2019, Validated 7th January 2020 Awaiting Decision</p>	<p>The Environmental Health officer has recommended the following condition: The applicant is required to make an assessment of the environmental impact of the development with particular emphasis on sustainable development and minimising contributions to air pollution from vehicle usage and road layout, biomass heating systems and use of fossil fuels. In addition, the applicant must consider control of odour emissions from sewage treatment works. SEPA have raised concerns about flood risk and maintained an objection on this basis.</p>	<p>No AQIA yet received</p>
<p>19/00173/FULL Erection Of 37 No. Flats, 16 No. Cottage Flats, 20 No. Houses, Golf Club Car Park, New Access Roads, SUDS Pond And Associated Landscaping, Parking and Infrastructure - Schawpark Golf Course Main Street Sauchie Clackmannanshire</p>	<p>Application Received 11th July 2019, Validated 23rd July 2019 Application Approved June 2020</p>	<p>No Air Quality Assessment carried out for development</p>	
<p>20/00220/FULL Erection of Reserve Gas Generation Facility with a Proposed Generation Capacity of 22.5 MW With Associated Infrastructure Including Ancillary Buildings, Access, Fencing and Landscaping at Land South Of Hennings Wood, Collyland Road, Fishcross</p>	<p>Application Received 12th October 2020, Validated 4th November 2020 Application Refused.</p>	<p>Response from SEPA on Air Quality Assessment: “Based on the information available to us, we are now in a position to remove our previous objection, subject to the following condition be attached to the consent:</p>	<p>Revised Air Quality Assessment was submitted in January 2021 following rejections of previous assessments during</p>

Name of Establishment	Data Submitted by Applicant	Assessment	Outcome
		<p>- the stack height to be at least 14.5m.”</p> <p>Response From Clackmannanshire Council Environmental Health Services on Air Quality Assessment:</p> <p>“The Environmental Health Service do not object to the conclusions of the updated Air Quality Assessment.”</p>	<p>2020.</p> <p>Planning Committee Meeting (May 2021) refused planning application on a number of grounds. Available to view</p> <p>https://publicaccess.clacks.gov.uk/publicaccess/applicationDetails.do?activeTab=documents&keyVal=QI2YF0EYMHP00</p> <p>The applicant however has three months to appeal decision if they so wish.</p>

6 Impact of COVID-19 upon LAQM

Clackmannanshire Council continued the operation of their air quality monitoring network throughout 2020. The introduction of Covid-19 national lockdowns during March and December impacted on the air quality monitoring results obtained during these months. The lockdowns meant that Clackmannanshire Council could not collect the diffusion tubes at the end of March and December for analysis and replace with new tubes for monitoring of the next respective months.

In this case, the diffusion tube results reported for April are actually an 8 week result, which includes the monitoring period during March. For the month of December, the implementation of the second national lockdown meant that the diffusion tubes could not be retrieved until February 2021. The results from the December diffusion tubes therefore correspond to a three month monitoring period and have therefore not been included in this report.

From the monitoring results reported in this ARP for 2020 highlight that the impact of Covid-19 on local air quality within Clackmannanshire during 2020 was a decrease in measured pollutant concentrations at all monitoring locations compared with 2019 values, with the largest difference evident at the diffusion tube locations. This decrease will be primarily due to the significant reduction in road traffic in 2020 due to the imposed travel bans, increased home working and non-essential businesses forced to close.

7 Conclusions and Proposed Actions

Conclusions from New Monitoring Data

During 2020, Clackmannanshire Council undertook monitoring of NO₂, PM₁₀ and PM_{2.5} concentrations at locations detailed in the report. The results indicate that concentrations complied with the air quality objectives.

There are no existing AQMAs within the Council area and based on the monitoring data obtained during 2020, it is concluded that no AQMAs are required to be declared.

Conclusions relating to New Local Developments

This assessment has been conducted in accordance with the TG(16) Technical Guidance. Updated information has been obtained on road, rail, industrial, domestic and fugitive emission sources and compared to criteria and conditions described in the Guidance.

The new/proposed local developments mentioned which could have a potential to impact local air quality in Clackmannanshire are presented in Table 5.1. Actions as to whether air quality assessments for these developments are required/have been requested are also detailed.

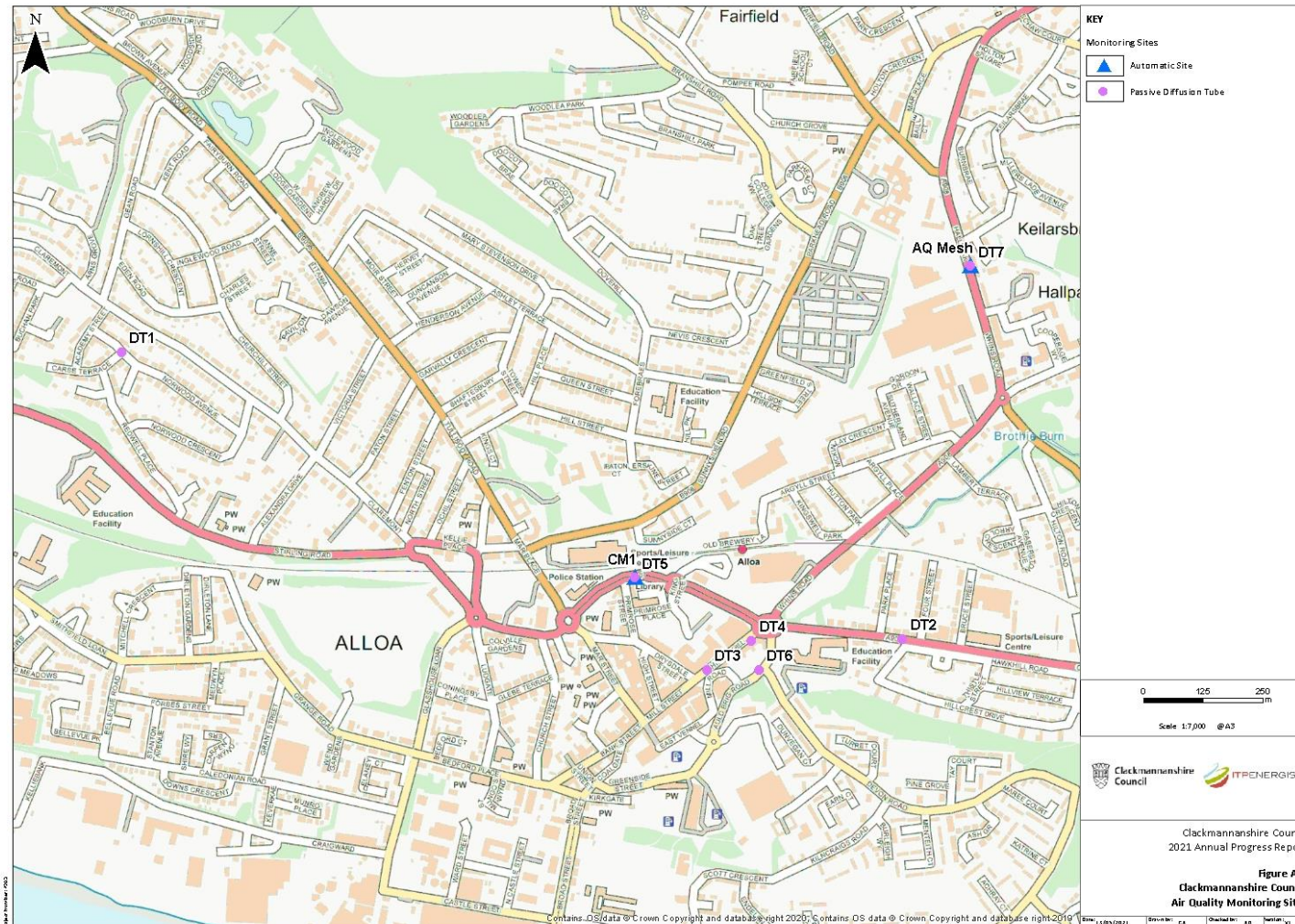
Proposed Actions

Clackmannanshire Council will continue to monitor and improve air quality, progressing the Actions to Improve Air Quality as outlined in Table 2.2.

As such, Clackmannanshire Council have made an application to the Scottish Government for funding support to replace the existing NO₂ monitor at CM1. The outcome of the application is awaited.

It is also planned to continue monitoring of NO₂ with the AQ Mesh and passive diffusion tube at Hallpark Road until at least the end of 2021.

Appendix A: Monitoring Results Figure A.1 – Air Quality Monitoring Locations within



Clackmannanshire

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	King Street, Alloa	Roadside	288665	693072	NO ₂ , PM ₁₀ , PM _{2.5}	N	NO ₂ Chemiluminescent; PM ₁₀ & PM _{2.5} FIDAS	1.22	2.45	2.3
AQ Mesh	Hallpark Road A908	Roadside	289371	693727	NO ₂ , PM ₁₀ , PM _{2.5}	N	NO ₂ electrical sensors, PM ₁₀ and PM _{2.5} using optical spectrometry	0	2.38	2.68

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?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT1	Norwood Avenue, Alloa ⁽³⁾	Kerbside	287588	693546	NO ₂	N	2	1.7	N
DT2	Clackmannan Road, Alloa	Kerbside	289228	692943	NO ₂	N	2	2	N
DT3	Bus Station, Alloa	Kerbside	288818	692878	NO ₂	N	2	1.3	N
DT4	Shillinghill/Bridge Terrace, Alloa	Kerbside	288911	692940	NO ₂	N	2	1.4	N
DT5	King Street, Alloa	Kerbside	288665	693072	NO ₂	N	8	2.45	Y
DT6	Auld Brig Road, Alloa	Kerbside	288927	692878	NO ₂	N	3	1.8	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT7	Pearson View, Sauchie ⁽³⁾	Roadside	289371	693727	NO ₂	N	0	2.38	Y

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.

(3) DT1 was relocated in August 2019 to Pearson View Sauchie (Façade on Hallpark Road) to be collocated with the AQMesh site and is now DT7.

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

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
CM1	Roadside	Automatic	99.5	99.5	27.6 (29.3)	22.6	23.0 ⁽⁶⁾	22.0	19.0
AQ Mesh	Roadside	Automatic	100	100	-	37.3 ⁽⁴⁾	43.0 (37.5) ⁽⁵⁾	15.2	14.6
DT1	Kerbside	Diffusion Tube	-	-	8.2	10.3	11.3	8.9	-
DT2	Kerbside	Diffusion Tube	83.3	83.3	24.7	25.7	23.4	21.7	16.1
DT3	Kerbside	Diffusion Tube	83.3	83.3	25.1	27.7	26.3	25.2	15.6
DT4	Kerbside	Diffusion Tube	83.3	83.3	23.9	23.9	25.2	22.5	15.2
DT5	Kerbside	Diffusion Tube	83.3	83.3	19.0 (20.0)	22.2 (23.2)	21.9	18.3	13.0
DT6	Kerbside	Diffusion Tube	83.3	83.3	21.5	23.6	21.8	16.8	13.0
DT7	Roadside	Diffusion Tube	83.3	83.3	-	-	-	20.6	11.8

Notes:

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

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%. Annualised Data are presented in brackets. 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%).
- (3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.
- (4) Period Mean for AQ Mesh
- (5) Annual Mean for AQ Mesh – Distance Corrected in brackets for closest receptor location
- (6) 2018 Concentration for CM1 was updated due to a change in ratified data report on the Scottish Air Quality website (reduce from 24 to 23 $\mu\text{g}/\text{m}^3$)

Table A.4 – 1-Hour Mean NO₂ Monitoring Results, Number of 1-Hour Means > 200µg/m³

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	99.5	99.5	0 (96)	0 (87)	0	0	0
AQ Mesh	Roadside	Automatic	100	100		0 (117)	0	0 (91.1)	0

Notes:

Exceedances of the NO₂ 1-hour mean objective (200 µg/m³ 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 PM₁₀ Monitoring Results (µg/m³)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
CM1	Roadside	99.5	99.5	13.0	12.0	11.0	11.0	9.0
AQ Mesh	Roadside	100	99.89	-	9.2	6.5	4.8	3.9

Notes:

Exceedances of the PM₁₀ annual mean objective of 18 µg/m³ are shown in bold.

All means have been “annualised” as per LAQM.TG(16), 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 PM₁₀ Monitoring Results, Number of PM₁₀ 24-Hour Means > 50µg/m³

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
CM1	Roadside	99.5	99.5	3	0	0	1	0
AQ Mesh	Roadside	100	99.89	-	2	0	0	0

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50 µg/m³ 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/m³)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2020 (%) ⁽²⁾	2016	2017	2018	2019	2020
CM1	Roadside	99.5	99.5	-	-	6.0	6.0	5.0
AQ Mesh	Roadside	100	99.89	-	3.9	3.5	2.8	2.0

Notes:

Exceedances of the PM_{2.5} annual mean objective of 10 µg/m³ are shown in bold.

All means have been “annualised” as per LAQM.TG(16), 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 – NO₂ 2020 Monthly Diffusion Tube Results (µg/m³)

Site ID	Jan	Feb	Mar ⁽²⁾	Apr ⁽²⁾	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec ⁽³⁾	Annual Mean: Raw Data	Annual Mean: Bias Adjusted ⁽¹⁾
DT1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DT2	36.9	30.4	-	17.2	15.2	16.2	2.5	9.2	17.2	20.1	15.7	-	18.1	16.1
DT3	31.1	31.9	-	16.0	15.3	15.9	7.9	8.0	21.6	19.7	8.1	-	17.6	15.6
DT4	31.9	27.5	-	19.1	13.8	18.7	4.7	12.5	2.1	27.2	13.4	-	17.1	15.2
DT5	24.5	23.7	-	14.4	12.7	18.9	9.5	13.0	2.1	17.6	10.2	-	14.7	13.0
DT6	34	32.7	-	16.9	11.8	16.2	3.2	6.8	2.3	20.9	1.8	-	14.7	13.0
DT7	23.7	21.1	-	14.9	9.2	16.4	2.0	9.1	13.5	15.8	6.7	-	13.2	11.8

Notes:

(1) See Appendix C for details on bias adjustment

(2) April concentrations are from 8 weeks worth of monitoring which started at beginning of March. This is due to the first Covid-19 lockdown implemented in March preventing collection and replacement of diffusion tubes at the end of March.

(3) December results not reported as implementation of second Covid-19 lockdown in December prevented collection of the diffusion tubes. Diffusion tubes were not collected until February 2021.

*Discontinued and relocated to DT7 in 2019

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

New or Changed Sources Identified Within Clackmannanshire Council During 2020

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

Additional Air Quality Works Undertaken by Clackmannanshire Council During 2020

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

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2020 were supplied and analysed by GSS, the tubes were prepared using the 20% TEA in water preparation method. All results have been bias adjusted and annualised (where required). GSS is a UKAS accredited laboratory and participates in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre.

The latest AIR-PT results were as follows:

- AIR-PT AR030 (January to February 2019) – 100%
- AIR-PT AR031 (April to May 2019) – 100%
- AIR-PT AR033 (July to August 2019) – 100%
- AIR-PT AR034 (September to November 2019) – 50%
- AIR-PT AR036 (January to February 2020) – 100%
- AIR-PT AR037 (May to June 2020) – No Results
- AIR-PT AR039 (July to August 2020) – No Results

- AIR-PT AR040 (September to October 2020) – 100%

Over a rolling five round AIR-PT window, it is expected that 95% of laboratory results should be $\leq +2$. If this percentage is substantially lower than 95% for a particular laboratory, within this five round window, then one can conclude that the laboratory in question may have sources of error within their analytical procedure.

The AIR-PT AR034 result of 50% was investigated by the laboratory to the satisfaction of their accreditation body UKAS and no reprocessing was required.

Excluding this result, the results of all round results from January 2019 were 100% demonstrating satisfactory performance of the laboratory.

There were no results recorded for AIR-PT AR037 and AR039. This was also the same for all other laboratories which analyse diffusion tubes. This is expected to be due to Covid-19 lockdown and restrictions which were in place at the time.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Clackmannanshire Council recorded data capture above 75%. Therefore, it was not required to annualise any monitoring data for 2020.

Diffusion Tube Bias Adjustment Factors

A summary of bias adjustment factors used by Clackmannanshire Council over the past five years is presented in

Table C.1.

The National bias adjustment factor spreadsheet 03/21 was used to derive the national bias adjustment factor for diffusion tubes analysed by Glasgow Scientific Services during 2020. The National Bias Adjustment Factor Spreadsheet used is shown in Figure C.1 below displaying the data for Glasgow Scientific Services.

An overall adjustment factor of 0.96 is calculated in the spreadsheet from 10 diffusion tubes which have been included in the study. Only two of these tubes however have Good precision.

A bias adjustment factor of 0.89 was calculated using only the tubes with Good precision. The value of 0.89 was therefore used as the adjustment factor for the monitored 2020 diffusion tube data.

Figure C.1 Glasgow Scientific Services – National Average Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/21			
Follow the steps below in the correct order to show the results of relevant co-location studies							This spreadsheet will be updated at the end of June 2021			
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods							Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet			
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.							LAQM Helpdesk Website			
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.					Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.					
Step 1:		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 ³ 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.	If you have your own co-location study then see footnote ⁴ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953						
Analysed By ¹	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁶	Bias Adjustment Factor (A) (Cm/Dm)
Glasgow Scientific Services	20% TEA in water	2020	R	East Dunbartonshire Council	11	23	19	16.3%	P	0.86
Glasgow Scientific Services	20% TEA in water	2020	R	East Dunbartonshire Council	9	16	19	-14.4%	P	1.17
Glasgow Scientific Services	20% TEA in water	2020	R	East Dunbartonshire Council	11	19	18	3.9%	G	0.96
Glasgow Scientific Services	20% TEA in water	2020	R	East Dunbartonshire Council	10	15	15	-0.1%	P	1.00
Glasgow Scientific Services	20% TEA in water	2020	KS	Marylebone Road Intercomparison	11	53	44	21.7%	G	0.82
Glasgow Scientific Services	20% TEA in water	2020	R	Glasgow City Council	12	26	23	13.1%	P	0.88
Glasgow Scientific Services	20% TEA in water	2020	R	Glasgow City Council	12	21	20	4.7%	P	0.96
Glasgow Scientific Services	20% TEA in water	2020	R	Glasgow City Council	11	22	23	-3.6%	P	1.04
Glasgow Scientific Services	20% TEA in water	2020	KS	Glasgow City Council	12	33	36	-8.4%	P	1.09
Glasgow Scientific Services	20% TEA in water	2020	UB	Glasgow City Council	12	19	17	6.9%	P	0.94
Overall Factor ³ (10 studies)								Use		0.96

Spreadsheet 03/21

Table C.1 – Bias Adjustment Factor

Year of Monitoring Data	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.89 ⁽¹⁾
2019	National	03/20	0.82 ⁽¹⁾
2018	National	03/19	0.92 ⁽¹⁾
2017	National	03/18	0.91
2016	National	03/17	0.97

(1) Adjustment Factor was derived from using only the diffusion tubes with Good precision

NO₂ Fall-off with Distance from the Road

No diffusion tube NO₂ monitoring locations within Clackmannanshire Council required distance correction during 2020.

QA/QC of Automatic Monitoring

Automatic monitoring of NO_x, PM₁₀ and PM_{2.5} is completed within Clackmannanshire Council using Chemiluminescence (NO_x), FDMS (PM₁₀) and FIDAS (PM₁₀ and PM_{2.5}) analysers. All data is available in real-time, and following data dissemination is ratified by Ricardo Energy and Environment to AURN standards.

The certificates of ratified data are included in Figure C.2.

Air Pollution Report

1st January to 31st December 2020



Alloa A907 (Site ID: ALO2)

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/m ³	NO ₂ µg/m ³	NO _x asNO ₂ µg/m ³	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³
Number Days Low	-	366	-	364	364
Number Days Moderate	-	0	-	0	0
Number Days High	-	0	-	0	0
Number Days Very High	-	0	-	0	0
Max Daily Mean	61	51	136	27	17
Annual Max	212	91	401	200	93
Annual Mean	12	19	37	9	5
98th Percentile of daily mean	-	-	-	20	-
90th Percentile of daily mean	-	-	-	14	-
99.8th Percentile of hourly mean	-	76	-	-	-
98th Percentile of hourly mean	67	57	155	25	16
95th Percentile of hourly mean	44	46	113	19	12
50th Percentile of hourly mean	5	15	23	8	4
% Annual data capture	99.50%	99.50%	99.50%	99.54%	99.54%

Instruments: PM₁₀: FIDAS

PM_{2.5}: 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 NO₂ 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.

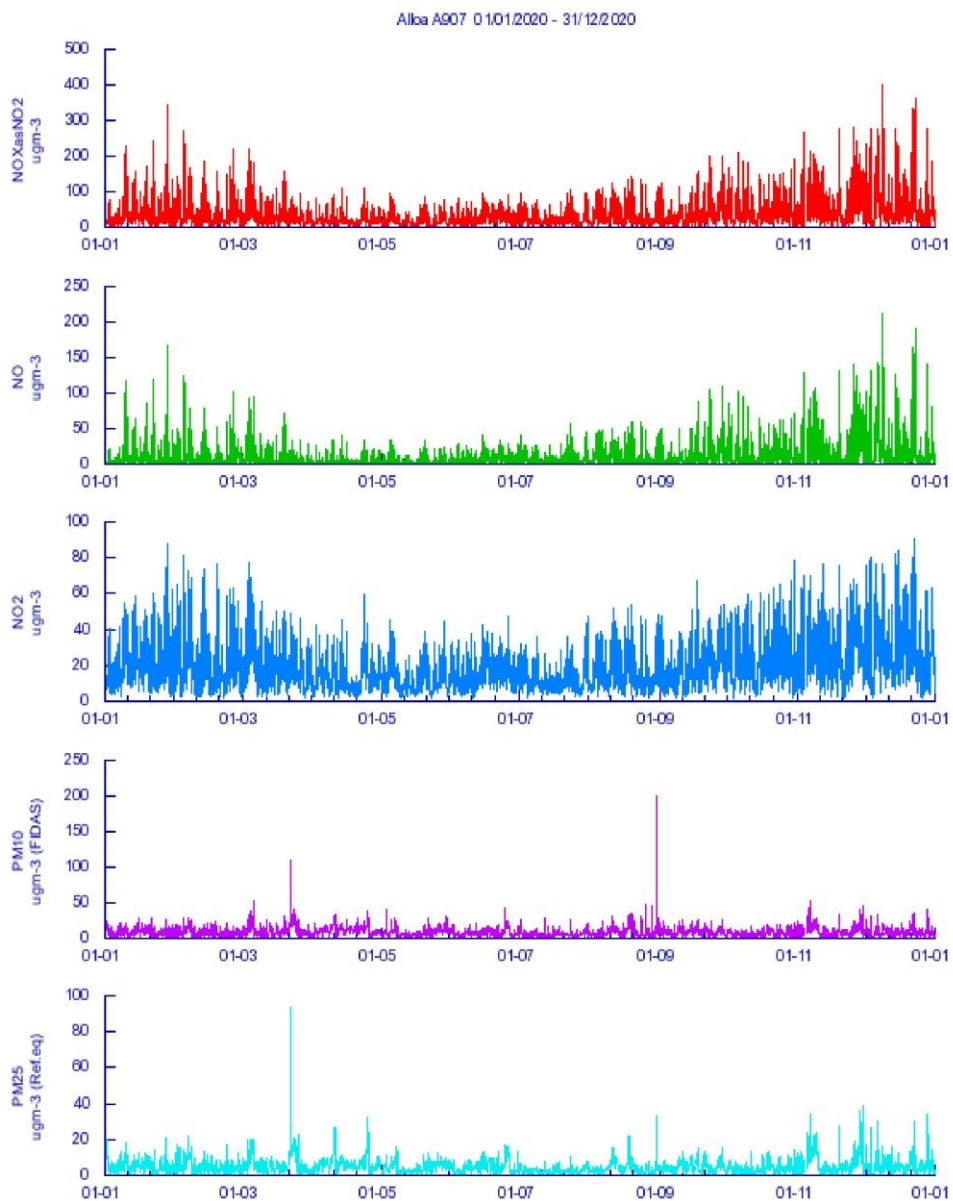
1 / 3

Report produced by Ricardo Energy & Environment

Figure C.2 Ratified Data from Ricardo Energy and Environment for King Street Alloa

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



3 / 3

Report produced by Ricardo Energy & Environment

PM₁₀ and PM_{2.5} Monitoring Adjustment

The type of PM₁₀ and PM_{2.5} monitor(s) utilised at site CM1 within Clackmannanshire Council do not require the application of a correction factor.

All PM₁₀ and PM_{2.5} data monitored by the AQ Mesh Pod is managed and adjusted by Acoem as necessary.

Automatic Monitoring Annualisation

All automatic monitoring locations within Clackmannanshire Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data.

NO₂ Fall-off with Distance from the Road

No automatic NO₂ monitoring locations within Clackmannanshire Council required distance correction during 2020.

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

References

1. Local Air Quality Management Guidance LAQM.TG(16), Department for Environment, Food and Rural Affairs (DEFRA), 2021
2. 2020 LAQM Air Quality Annual Progress Report, ITP Energised Limited, Ref: 3344-2020, 20th October 2020
3. 2019 LAQM Air Quality Annual Progress Report, ITP Energised Limited, Ref: EDI_1471-2019, 2nd July 2019
4. 2018 LAQM Air Quality Annual Progress Report, ITP Energised Limited, Ref: 11354-001, 13th June 2018
5. 2017 LAQM Air Quality Annual Progress Report, ITP Energised Limited, Ref:11032-001, 28th June 2017
6. 2016 LAQM Air Quality Annual Progress Report, TSI Scotland Limited, TSI/CLA.007-04-01, 20 October 2016
7. LAQM TG(16), Page 7 to 14, Box 7.2
8. The Clackmannanshire Sustainability and Climate Change Strategy, 2010
9. Clackmannanshire Local Development Plan, 2015
10. Clackmannanshire Council Local Transport Strategy 2009-2014
11. Clackmannanshire Council Climate Change Duties Summary Report 2019