




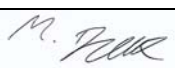
2022 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995
Local Air Quality Management

Date: November 2022

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Executive Summary: Air Quality in Our Area

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The report covers two reporting periods for the years 2020 and 2021.

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 exceedances are considered likely, the local authority must then 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.

Air Quality in Pendle Borough Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

² Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Air quality appraisal: damage cost guidance, July 2021

million in 2017⁴. For the borough of Pendle, the current mortality attributed to anthropogenic (made man) particulate air pollution is 4.9%⁵.

The principal pollutants of concern within Pendle are those associated mainly with traffic, these being Nitrogen Dioxide, and Particulate Matter. The Council only monitors Nitrogen Dioxide emissions via a network of diffusion tubes and currently has no declared Air Quality Management Areas within the borough. **Trend data over the last five years indicates that levels have generally reduced, the results from 2020 & 2021 show no areas of exceedance or near exceedance of the national objectives within the borough, including within the Colne Designated Air Quality Management Area.**

However, given the continual evidence identifying the harmful effects of both Particulate Matter and Nitrogen Dioxide, along with the Councils commitment to work with partners on the public health agenda and the Council's duties under the Local Air Quality Management regime, combined with the significant development within the area, it is important that work continues to maintain and improve the air quality within the borough.

To that end, the Pendle Borough Council will continue to identify measures to improve and maintain the air quality within the borough, including ensuring developments do not adversely affect or significantly contribute to pollutant levels. This will be helped by the adoption of an Air Quality Planning Guidance document.

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

⁵ Public Health England, Public Health Profiles, Air Pollution: fine particulate matter 2019
https://fingertips.phe.org.uk/search/air%20pollution#page/0/gid/1/pat/102/par/E10000017/ati/101/iid/30101/age/230/sex/4/cid/4/tbm/1/page-options/car-do-0_ovw-do-0

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy⁶ sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero⁷ sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Key actions the Council will be looking at over the next year included:

- Continuing with the diffusion tube monitoring programme,
- Continue to consider air quality for all relevant planning applications, work with planners to implement an automatic consideration of air quality on large planning applications and to further progress the adoption of an Air Quality Planning Guidance note, setting out how and when air quality issues need to be considered as part of the planning process.
- We will continue to carry out the inspections and enforcement of permitted premises within the borough under the Environmental Permitting Regulations.
- Continue to work with partners in Public Health Lancashire, and across the Lancashire District authorities in the development and publication of a Lancashire Air Quality Planning Guidance Document.
- Encourage greater use of public transport and alternative forms of travel, including the provision of electric vehicle recharging points through the planning system.
- Continue to work towards achievement of the measures identified within the Council's Air Quality Action Plan.

⁶ Defra. Clean Air Strategy, 2019

⁷ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

Conclusions and Priorities

The results from the 2021 monitoring programme and review of the government data have identified no areas of likely exceedances of the national objective values for any of the pollutants of concern. The monitoring programme has identified that the nitrogen dioxide levels are low across the borough at sensitive receptor locations.

All monitoring locations have shown a reduction in Nitrogen Dioxide concentrations on 2020 figures, 2021 data was lower, but this covered a period of national and local lockdowns due to the Covid pandemic and the year is not considered to be representative of the normal situation.

As a priority over the coming months the Council will continue to work with partner organisations, in particular the County Public Health team and other local authorities on the implementation of the county wide guidance document for planning and the installation of electric vehicle charging points.

Local Engagement and How to get Involved

If you would like to get involved in the work being undertaken to tackle air pollution within Pendle; or you would like more information on how you can help reduce your personal emissions then please contact the Environmental Health Department at Pendle Borough Council on 01282 662009 or via e-mail at Michael.Duck@Pendle.gov.uk. Further information will be made available on the Council's website.

Local Responsibilities and Commitment

This ASR was prepared on behalf of the Environmental Health Department of Pendle Borough Council with the support and agreement of the following officers and departments:

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1 Local Air Quality Management

This report provides an overview of air quality in Pendle Borough Council during 2020/2021. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Pendle Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

Air Quality Management Areas

Air Quality Management Areas (AQMA) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMA declared by Pendle Borough Council can be found in Table 2.1. The table presents a description of the Colne AQMA that is currently designated within Pendle Borough Council. Appendix D: Map(s) of Monitoring Locations and AQMA provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation(s) are as follows:

- NO₂ annual mean;

Monitoring results from recent years have been affected by the Covid pandemic, however now that activities across the region have returned to a more normal pattern, should results continue to indicate Nitrogen Dioxide levels are significantly below the nation objective value of 40µg/m³ the Council will look to revoke the declare AQMA.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
Colne AQMA	10th March 2011	NO2 Annual Mean	Area incorporating Windsor St, and Skipton Rd, Colne, between the junctions of Windsor St ? Byron St and Temple St / Oak St	NO	40.1µg/m ³	30.8µg/m ³	Colne AQMA Air Quality Action Plan, Pendle Borough Council August 2015	

X Pendle Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date.

X Pendle Borough Council confirm that all current AQAPs have been submitted to Defra.

Progress and Impact of Measures to address Air Quality in Pendle Borough Council

Defra's appraisal of last year's ASR concluded:

- That the Council were closely monitoring and reviewing AQMA designations both potential declarations and revocation of the existing AQMA,
- In relation to the revocation of the existing AQMA, the appraisal highlights that care needs to be taken when reviewing 2020 figures due to the Covid Pandemic,
- Trend data is presented and discussed but could be clearer.

Pendle Borough Council has taken forward a number of direct measures during the last two years, 2020 & 2021 in pursuit of improving local air quality. However, the Covid pandemic did significantly disrupt progress over this period. Details of all measures completed, in progress or planned are set out in Table 2.2. 30 measures are included within Table 2.2, with the type of measure and the progress Pendle Borough Council have made during the reporting year of 2021 & 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

More detail on these measures can be found in their respective Action Plans "*Colne, AQMA, Air Quality Action Plan, Pendle Borough Council, 2015*".

In addition to the measures undertaken to improve air quality the Council has also declared a Climate Emergency with many actions to reduce carbon emissions towards the goal of net-zero by 2030 also helping to improve air quality

Pendle Borough Council are pleased to confirm that the tail into the use of hydrated vegetable oil (HVO) as fuel for the Councils refuse collection service has been completed and if the decision has now been made to continue the use of the HVO on a permanent basis. This should reduce the Council's carbon emissions by 500,000 kg of CO₂ / year, while reducing NO₂ and PM₁₀ emissions at the same time.

Pendle Borough Council's priorities for the coming year are to;

- complete the air quality monitoring programme.
- require Air Quality Assessments to be undertaken on all relevant planning applications.
- require mitigation measures were appropriate on planning applications.
- Progress engagement and educational programmes both internally and externally.

Pendle Borough Council worked to implement these measures in partnership with the following stakeholders during 2020-2021:

- Lancashire County Council;
- The Highways Authority;

The principal challenges and barriers to implementation that Pendle Borough Council anticipates facing are lack of sufficient staff and resources to implement actions, both internally and within partner organisations. However, it is acknowledged that work to tackle the Climate Emergency within the Council and reduce carbon emissions will also assist in improving air quality.

Progress on a number of measures has been slower than expected due to the lack of sufficient staff resources. This is not likely to change in the near future but it is hoped some progress will be made on those internal actions to reduce Council fleet emissions and promotion and educational activities to members of the public.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2013	2030	LCC	LCC	NO	Not Funded	£1 million - £10 million	Planning	estimated significant reduction in pollutant levels within villages along the A56	Start of construction	Feasibility Study undertaken	Funding		
Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2012	2030	PBC, LCC, Skipton East Lancashire Railway Action Partnership (SELRAP)	-	NO	Not Funded	£1 million - £10 million	Planning	Reduction in private vehicle trips thus reduction in pollutant levels	commissioning of service	Feasibility Study undertaken	Funding		
Traffic Management	UTC, Congestion management, traffic reduction	2015	2030	DfT	DfT	NO	Not Funded	£1 million - £10 million	Planning	reduced emissions	DfT annoyance funding	None	DfT / Funding		
Traffic Management	Reduction of speed limits, 20mph zones	2015	2030	LCC	LCC	NO	Not Funded	£1 million - £10 million	Planning	1.1µg/m3	Measures identified and implemented	None	Funding		
Freight and Delivery Management	Freight Partnerships for city centre deliveries	2015	2030	PBC	-	NO	Not Funded	£500k - £1 million	Planning	~32% NO2 reduction, 3.6µg/m3	implementation of FQP	None	Funding/Staffing		
Traffic Management	Reduction of speed limits, 20mph	2015	2030	PBC, LCC	-	NO	Not Funded	£50k - £100k	Planning	2.1µg/m3 reduction	Introduction of 20mph speed limit	None	Staffing/Funding /public acceptance.		
Public Information	Other	2015	2032	PBC	-	NO	Not Funded	£50k - £100k	Planning	11%reduction in car trips 15-33%increase in walking, cycling and use of public transport.	reduction in traffic flow	County transport plan	Staffing/Funding		

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Transport Planning and Infrastructure	Bus route improvements	2015	2030	PBC, LCC	-	NO	Not Funded	£1 million - £10 million	Planning	reduction of current bus emissions which account for 4% of total NO2	improved bus fleet	None	Funding, staffing, willing bus company		
Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2015	2030	PBC	-	NO	Not Funded	£1 million - £10 million	Planning	up to 29% of NOx emissions	planning granted for P&R	None	Funding, Land,		
Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2015	2030	LCC PBC	S.106/LCC	NO	Not Funded	£500k - £1 million	Planning	reduced emissions from buses	new/improved services	None	Funding		
Public Information	Other	2015	2025	PBC	PBC	NO	Not Funded	< £10k	planning	reduced emissions from idling vehicles	reduction in idling.	Officers are authorised to enforce anti-idling legislation, but staff resources are limited.	Staff resources		
Freight and Delivery Management	Freight Consolidation Centre	2015	2032	LCC, PBC	-	NO	Not Funded	£1 million - £10 million	Planning	up to 32% NO2 emissions from HGV's	commissioning FCC	None	Funding		
Vehicle Fleet Efficiency	Testing Vehicle Emissions	2015		PBC	PBC	NO	Partially Funded	< £10k	Implementation	reduced emissions from PBC fleet	regular emissions testing	Council vehicles already undergo an enhanced service plan and regular MOT inspections to ensure	funding to increase beyond legal minimum, lack of operational benefit.		
Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2015	2025	PBC	PBC	NO	Not Funded	£50k - £100k	Planning	reduced emissions from PBC fleet	fleet emission reduction	Review of Council fleet and possibly retrofit options being considered. Trail of eco fuel scheme completed and fully implemented.	Funding, Staff resources, technology		

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2015	2025	PBC	PBC	NO	Not Funded	£100k - £500k	Implementation	reduced fleet emissions	replaced fleet	programme of fleet replacement in place with a view to increase Electric vehicles as appropriate	Funding, suitable EV vehicles.		
Promoting Travel Alternatives		2015		PBC	PBC	No	Not Funded	< £10k	Planning	reduced emissions from car journeys	reduced vehicle trips	None	Funding, staff time,		
Public Information	Other	2015		PBC	PBC	NO	Not Funded	£10k - 50k	Planning	Improved education, resulting in lower emissions from burner and transport	delivery of educational program	Basic information and links provided on website.	Funding, staff time,		
Promoting Travel Alternatives		2015		PBC / Sustrans		No	Not Funded	< £10k	Planning	reduced traffic emissions	collaborative working with Sustrans	None	Staff resources		
Promoting Travel Alternatives		2015		PBC	PBC	NO	Not Funded	< £10k	Planning	reduced traffic emissions	promotion of cycling to employees and use of cycle mileage claims	None	Staff resources, cycle mileage payment		
Public Information	Via the Internet	2015		PBC / Defra	PBC / Defra	NO	Partially Funded	£10k - 50k	Implementation	Improved knowledge	real time data available to public	Link to Defra Air Pollution Forecast website included on PBC website			

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Promoting Travel Alternatives		2015		PBC / LCC / Schools	LCC	NO	Partially Funded	£10k - 50k	Implementation	Reduced schools' trips, reduced traffic emissions	Implementation of travel plans at each school	Encouragement of travel plans within schools underway, basic template provided.	Staff Resources, other prioritise		
Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015		PBC	PBC	NO	Partially Funded	£10k - 50k	Implementation	Reduced emissions from developments / associated traffic	Comments made on each relevant application	Air quality comments made on each relevant planning application submitted to PBC	ongoing work,		
Policy Guidance and Development Control	Other policy	2015		PBC	PBC	NO	Not Funded	< £10k	Implementation	Reduced emissions from developments / associated traffic	participation in policy discussions and consultations	ongoing			
Environmental Permits	Other	2015		PBC	PBC	NO	Partially Funded	£10k - 50k	Implementation	control of emissions from Permitted processes	completion of permit inspection process	Ongoing, processes are being inspected as per risk rating scheme. Officers actively seeking new processes during daily activities.	on-going		
Other	Other	2015		PBC	PBC	NO	Partially Funded	£10k - 50k	Implementation	Prevent unnecessary emissions	Response to complaints received	Ongoing enforcement in line with Councils enforcement policy	on-going measure.		

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
Public Information	Other	2015		PBC	PBC	NO	Funded	£10k - 50k	Implementation	Monitoring of emissions to inform other actions	Completion of monitoring program	on-going monitoring program.			

PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Pendle Borough Council do not currently measure for PM_{2.5} however all the actions listed within the Councils Air Quality Action Plan will assist in reducing PM_{2.5} as well as NO₂.

Pendle Borough Council is taking the following measures to address PM_{2.5}:

- The Borough has several designated Smoke Control Areas, covering the densely populated areas, and these are enforced where necessary. The Council responds to any complaint about smoke from chimneys or rubbish burning and works proactively to advise on the harm done by smoke emissions, and where education fails, we will take enforcement action.
- Encouraging the provision of EVR points on all new developments.
- Investigate the options for the provision of EVR points on Council car parks, currently trying to source funding.
- Raise awareness of the harmful effects of PM_{2.5} using the Public Health Indicator's which demonstrate that Pendle suffers from an adult mortality attributed to particulate matter of 4.9% (2019)
- Lancashire County Council have set out an ambitious cycling and walking strategy, called "Actively Moving Forward", which aims to increase the number of people actively travelling across the region by 2028. Through improving and increasing access to infrastructure, alongside training and promotional activities.
- As part of the Lancashire cycling and walking strategy, work is progressing on the development of Local Cycling and Walking Infrastructure Plans (LCWIPs).

Lancashire County Council Actions on PM_{2.5}

In Lancashire the strongest evidence we have on the population health impacts of air pollution comes from Public Health England's Public Health Outcomes Framework. This Framework estimates 'the fraction of adult mortality attributable to particulate air pollution (PM_{2.5})' each year. It shows that, while the overall mortality rate from particulate air pollution in Lancashire-12 (4.0%) is lower than the England average (5.1%), air pollution remains a significant public health issue for the county.

Working with district councils, Lancashire County Council (LCC) has an important role to play in taking action to reduce the health impacts of air pollution. Responsible for transport planning, network management, highway maintenance, public health and procuring local vehicle fleets, there are a number of ways LCC can support local and county wide efforts to improve air quality. In summary, the following activities are underway or in development:

1. Encouraging the use of sustainable forms of travel
 - Lancashire's cycling and walking strategy, *Actively Moving Forward*, sets out an ambitious plan for increasing the number of people walking and cycling in the county by 2028. By improving and increasing access to cycling and walking infrastructure, alongside training and promotional activities, it aims to significantly increase the amount of cycling and walking people do across the county. Information on the County Council's ongoing activities in this area can be found on the [Active Travel in Lancashire](#) website.
 - As part of Lancashire's cycling and walking strategy, work has now commenced on developing Local Cycling and Walking Infrastructure Plans (LCWIPs) for the five Lancashire Highway and Transport Masterplan areas. The Plans will include a network plan for cycling and walking infrastructure and a prioritised list of schemes for delivery over short-, medium- and long-term timeframes. These plans will be used to support future infrastructure decisions and to access new funding schemes as they become available.
 - The Road Safety Teamwork with schools, workplaces and the community to encourage safe and sustainable modes of travel. Initiatives for schools are promoted through the Safer Travel Moodle and include: a series of cycling and

walking safety training programmes; guidance and resources for teachers to encourage safe and active travel; and support for creating travel plans.

2. Supporting the transition to low emission vehicles

- The County Council is working with BP Chargemaster to deliver 150 electric vehicle charge points across the County. The charging network will be accessible to drivers from all over the country and will support local and national efforts to increase the number of drivers purchasing electric vehicles.
- The County Council is supporting six district councils with a low emission taxi infrastructure scheme. Funded by the Office for Low Emission Vehicles, the scheme will provide taxi drivers with access to 24 new rapid electric vehicle charge points across the six districts. This, alongside a series of promotional activities and suggested regulatory changes, is designed to produce a transition towards more low emission taxi vehicles across Lancashire.

3. Creating cleaner, healthier road networks

- Work to develop the next Local Transport Plan (LTP4) for Lancashire, Blackpool and Blackburn with Darwen is now underway. The Public Health team has submitted an evidence base to the process, highlighting transport related health challenges affecting the population of Lancashire and making recommendations about how local transport planning policy can make a contribution to addressing these. Air quality is one of the key themes of the evidence base and will be an identified priority in LTP4. The local Highways and Transport Masterplans will be refreshed to align with the priorities of LTP4. This will provide an opportunity to identify longer-term network solutions that address issues in AQMAs and have a positive impact on air quality generally.
- The Lancaster City Centre Movement Strategy is looking at how vehicular, public transport and pedestrian walking movements can be improved across the city. A key facet of the study is to examine what improvements can be implemented to prioritise public transport, reduce severance, improve air quality and effectively

make the city centre a more welcoming environment for people. The intention is for a similar approach to be adopted as part of future Highways and Transport Masterplans.

4. Embedding air quality into policy

- The County Council works with district planners to ensure air quality is a key consideration of Local Plans, alongside wider public health issues. It supports district councils in developing policies that seek to ensure new developments do not contribute to increasing levels of air pollutants and that requirements for appropriate mitigation are in place.
- The County Council, as part of its highways input into planning applications, actively encourages measures that aim to promote sustainable forms of travel. Working under the direction of the National Planning Policy Framework, the County Council seeks measures that facilitate cycling and walking, increase the use of public transport and provide access to electric vehicle charge points. The County Council also seeks funding from developers, through section 106 contributions, to support existing bus services or to provide new bus services suitable to serve development sites once their built.

5. Raising awareness and increasing engagement

- The Lancashire Insight website provides information on the sources and health impacts of air pollution across the county. Webpages include a Summary of Emissions Data, Monitoring of Air Quality and Health Impacts and an Air Quality and Health Dashboard.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2020-2021 by Pendle Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

Review of Area

A review of the area has been undertaken to assess any changes that have occurred over the last 12 months and the potential for these to impact either negatively or positively on air quality.

A number of large residential developments have been granted planning permission or begun construction. Air quality reports have been prepared for most of these developments indicating a negligible impact. The majority of the sites will see construction work continuing through 2022.

There have been no major road improvements or new roads or significant changes in traffic flow over the last two year, with no significant changes to the railway network throughout the borough. Traffic flows did reduce significantly during the Covid pandemic but have returned to normal levels since the lifting of restrictions within the region.

There are no new of significantly changed bus depots or ports or airports within the borough.

Monitoring of the area using diffusion tubes is currently being undertaken by the Council and the results are detailed below.

No new significant industrial sources, including significant biomass plants have been identified which are likely to make a significant contribution to pollutant emissions.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Pendle Borough Council does not undertake any automatic monitoring for any pollutant across the borough.

3.1.2 Non-Automatic Monitoring Sites

Pendle Borough Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 50 sites during 2020 & 2021. This includes 17 duplicate sites and one triplicate site Table A.1 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 & 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 & Table B.1 includes distance corrected values, only where relevant.

No exceedances of the relevant National objective values have been identified in either reporting year (2020 & 2021).

3.1.4 Particulate Matter (PM₁₀ & PM_{2.5})

Pendle Borough Council does not monitor PM₁₀ or PM_{2.5} levels. However, a check of the Defra background maps indicates no likely exceedances of the objective levels for either of these two pollutants.

3.1.5 Sulphur Dioxide (SO₂)

Pendle Borough Council does not monitor SO₂ levels, a check of the Defra background maps indicates that there are no likely exceedances of the objective levels for this pollutant.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
PEN28	Pendle Business Centre	Roadside	386296	437592	NO2	No	25.0	31.0	No	2.5
PEN13, PEN14	Brunswick Street, Nelson	Roadside	386109	437634	NO2	No	0.0	6.0	No	2.5
PEN17	62 Burnley Road, Brierfield	Roadside	384610	436118	NO2	No	0.0	2.0	No	2.5
PEN72	82 Burnley Road, Brierfield	Roadside	384587	436098	NO2	No	0.0	1.0	No	2.5
PEN73	92 Burnley Road, Brierfield	Roadside	384576	436006	NO2	No	0.0	1.5	No	2.5
PEN99	18 Burnley Road, Brierfield (Bottom Hill Street)	Roadside	384683	436357	NO2	No	0.0	2.0	No	2.5
PEN91, PEN92	3 Burnley Road, Brierfield	Roadside	384664	436365	NO2	No	0.0	3.2	No	2.5
PEN93, PEN94	62 Colne Road, Brierfield	Roadside	384682	436650	NO2	No	0.0	3.5	No	2.5
PEN11, PEN12	25 Gisburn Road, Barrowford	Roadside	385734	438965	NO2	No	0.0	2.5	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid (Northing)		Which AQMA?	Distance to Relevant Exposure (m) ^(a)	Distance to kerb of nearest road (m) ^(a)	Tube Co- a Analyser?	Height
PEN74	14 Gisburn Road, Barrowford	Roadside	385728	438925	NO2	No	0.0	2.0	No	2.5
PEN75	17 Gisburn Road, Barrowford	Roadside	385732	438936	NO2	No	0.0	2.5	No	2.5
PEN95, PEN96	145 Gisburn Road, Barrowford	Roadside	385975	439719	NO2	No	0.0	4.3	No	2.5
PEN97, PEN98	2 Brookbank, Barrowford	Roadside	386101	439797	NO2	No	0.0	3.5	No	2.5
PEN90	37 Parker Street, Colne	Urban Background	388138	440143	NO2	No	0.0	2.0	No	2.5
PEN82, PEN83	257 North Valley Road, Colne	Roadside	389061	440482	NO2	Yes - Colne	0.0	4.0	No	2.5
PEN84, PEN85	Junction North Valley/Langroyd Road, Colne	Roadside	389079	440492	NO2	Yes - Colne	0.0	2.0	No	2.5
PEN76, PEN77	9 Langroyd Road, Colne	Roadside	389081	440519	NO2	No	0.0	2.0	No	2.5
PEN78, PEN79	10 Langroyd Road, Colne	Roadside	389098	440508	NO2	No	0.0	3.0	No	2.5
PEN36	22 Langroyd Road, Colne	Roadside	389102	440540	NO2	No	0.0	3.0	No	2.5
PEN86, PEN87	Likkle Monkeys Nursery, Langroyd Road, Colne RHS	Roadside	389105	440484	NO2	Yes - Colne	25.0	4.0	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid (Northing)		Which AQMA?	Distance to Relevant Exposure (m) ^(a)	Distance to kerb of nearest road (m) ^(a)	Tube Co- a Analyser?	Height
PEN65, PEN66	60 Windsor Street, Colne	Roadside	389159	440488	NO2	Yes - Colne	0.0	4.0	No	2.5
PEN67, PEN 68	44 Windsor Street, Colne	Roadside	389207	440484	NO2	Yes - Colne	0.0	4.0	No	2.5
PEN69, PEN70	32 Windsor Street, Colne	Roadside	389250	440482	NO2	Yes - Colne	0.0	4.0	No	2.5
PEN63, PEN 64	100 Skipton Road, Colne	Roadside	389425	440490	NO2	Yes - Colne	0.0	5.0	No	2.5
PEN3, PEN4, PEN54	92 Skipton Road, Colne	Roadside	389410	440463	NO2	Yes - Colne	0.0	6.0	No	2.5
PEN5, PEN6	Town Hall, Albert Road, Colne	Urban Centre	388820	440045	NO2	No	2.0	3.5	No	2.5
PEN71	Rowlands, 7 Albert Road, Colne	Urban Centre	388755	440026	NO2	No	0.0	4.0	No	2.5
PEN47	Jaipur, 19 Albert Road, Colne	Urban Centre	388711	439999	NO2	No	0.0	5.0	No	2.5
PEN46	52 Albert Road, Colne	Urban Centre	388655	440002	NO2	No	0.0	6.0	No	2.5
PEN7, PEN8	Junc Lord St/Albert Road, Colne	Roadside	388389	439924	NO2	No	0.0	2.0	No	2.5
PEN50	59 Burnley Road, Colne	Roadside	387922	439500	NO2	No	0.0	2.0	No	2.5

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 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
PEN28	386296	437592	Roadside	91.6	82.5	17.1	15.0	17.4	13.0	14.7
PEN13	386109	437634	Roadside	91.6	89.7	31.0	27.7	31.7	24.1	25.8
PEN14	386109	437634	Roadside	91.6	89.7	31.0	27.7	31.7	23.3	26.4
PEN17	384610	436118	Roadside	91.6	92.2	35.6	38.8	34.7	26.9	27.8
PEN72	384587	436098	Roadside	91.6	91.9	31.4	29.0	30.6	23.9	27.2
PEN73	384576	436006	Roadside	91.6	85.5	32.5	31.2	32.0	25.6	28.8
PEN99	384683	436357	Roadside	91.6	92.2	34.7	34.5	37.7	25.6	28.9
PEN91	384664	436365	Roadside	91.6	100.0	39.1	31.4	37.5	27.5	30.9
PEN92	384664	436365	Roadside	91.6	92.2	39.1	31.4	37.5	29.2	31.5
PEN93	384682	436650	Roadside	91.6	100.0	35.6	30.6	35.1	25.6	28.7
PEN94	384682	436650	Roadside	91.6	100.0	35.6	30.6	35.1	25.9	29.0
PEN11	385734	438965	Roadside	91.6	89.7	28.8	27.4	29.6	21.9	24.7
PEN12	385734	438965	Roadside	91.6	100.0	28.8	27.4	29.6	21.4	24.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
PEN74	385728	438925	Roadside	91.6	100.0	29.4	27.9	29.4	22.2	24.9
PEN75	385732	438936	Roadside	91.6	89.4	35.0	28.9	31.5	24.6	26.7
PEN95	385975	439719	Roadside	91.6	91.9	30.1	28.1	28.9	20.9	23.6
PEN96	385975	439719	Roadside	91.6	92.2	30.1	28.1	28.9	20.4	24.0
PEN97	386101	439797	Roadside	91.6	100.0	28.4	26.0	26.8	20.0	21.6
PEN98	386101	439797	Roadside	91.6	100.0	28.4	26.0	26.8	21.2	20.8
PEN90	388138	440143	Urban Background	91.6	68.5	28.3	23.6	26.7	12.3	21.3
PEN82	389061	440482	Roadside	91.6	100.0	30.9	28.2	31.0	24.8	23.7
PEN83	389061	440482	Roadside	91.6	100.0	30.9	28.2	31.0	25.0	25.3
PEN84	389079	440492	Roadside	91.6	100.0	40.7	36.3	37.6	28.8	30.0
PEN85	389079	440492	Roadside	91.6	100.0	40.7	36.3	37.6	30.0	30.6
PEN76	389081	440519	Roadside	91.6	90.0		26.3	28.0	20.0	22.7
PEN77	389081	440519	Roadside	91.6	100.0		26.3	28.0	18.1	22.9
PEN78	389098	440508	Roadside	91.6	100.0		31.6	31.7	24.3	26.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
PEN79	389098	440508	Roadside	91.6	100.0		31.6	31.7	25.4	27.2
PEN36	389102	440540	Roadside	91.6	100.0	28.6	29.3	30.2	20.9	24.4
PEN86	389105	440484	Roadside	91.6	100.0	40.3	37.4	37.9	27.7	30.8
PEN87	389105	440484	Roadside	91.6	100.0	40.3	37.4	37.9	27.1	29.4
PEN65	389159	440488	Roadside	91.6	92.2	39.9	30.5	29.9	18.3	23.0
PEN66	389159	440488	Roadside	91.6	69.9	39.9	30.5	29.9	21.0	29.5
PEN67	389207	440484	Roadside	91.6	85.2	35.5	32.0	32.8	23.9	28.0
PEN68	389207	440484	Roadside	91.6	84.1	35.5	32.0	32.8	25.5	27.1
PEN69	389250	440482	Roadside	91.6	92.2	33.2	29.3	29.8	21.9	25.6
PEN70	389250	440482	Roadside	91.6	92.2	33.2	29.3	29.8	22.2	25.2
PEN63	389425	440490	Roadside	91.6	92.2	29.4	28.1	27.1	18.4	19.0
PEN64	389425	440490	Roadside	91.6	92.2	29.4	28.1	27.1	20.2	20.0
PEN3	389410	440463	Roadside	91.6	82.2	33.7	33.7	26.8	21.2	23.2
PEN4, PEN54	389410	440463	Roadside	91.6	77.7	33.7	33.7	26.8	22.1	24.4

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
PEN5	388820	440045	Urban Centre	91.6	78.6	34.8	29.5	31.1	25.2	26.1
PEN6	388820	440045	Urban Centre	91.6	84.1	34.8	29.5	31.1	23.3	24.7
PEN71	388755	440026	Urban Centre	91.6	100.0	35.2	32.0	31.2	23.7	25.1
PEN47	388711	439999	Urban Centre	91.6	92.2	34.9	30.7	31.4	22.4	27.5
PEN46	388655	440002	Urban Centre	91.6	100.0	30.9	26.2	29.9	21.6	25.3
PEN7	388389	439924	Roadside	91.6	100.0	32.8	30.8	29.3	20.6	23.7
PEN8	388389	439924	Roadside	91.6	100.0	32.8	30.8	29.3	19.9	23.9
PEN50	387922	439500	Roadside	91.6	100.0	33.7	30.4	30.4	22.7	26.6

X Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16

X Diffusion tube data has been bias adjusted

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

Notes:

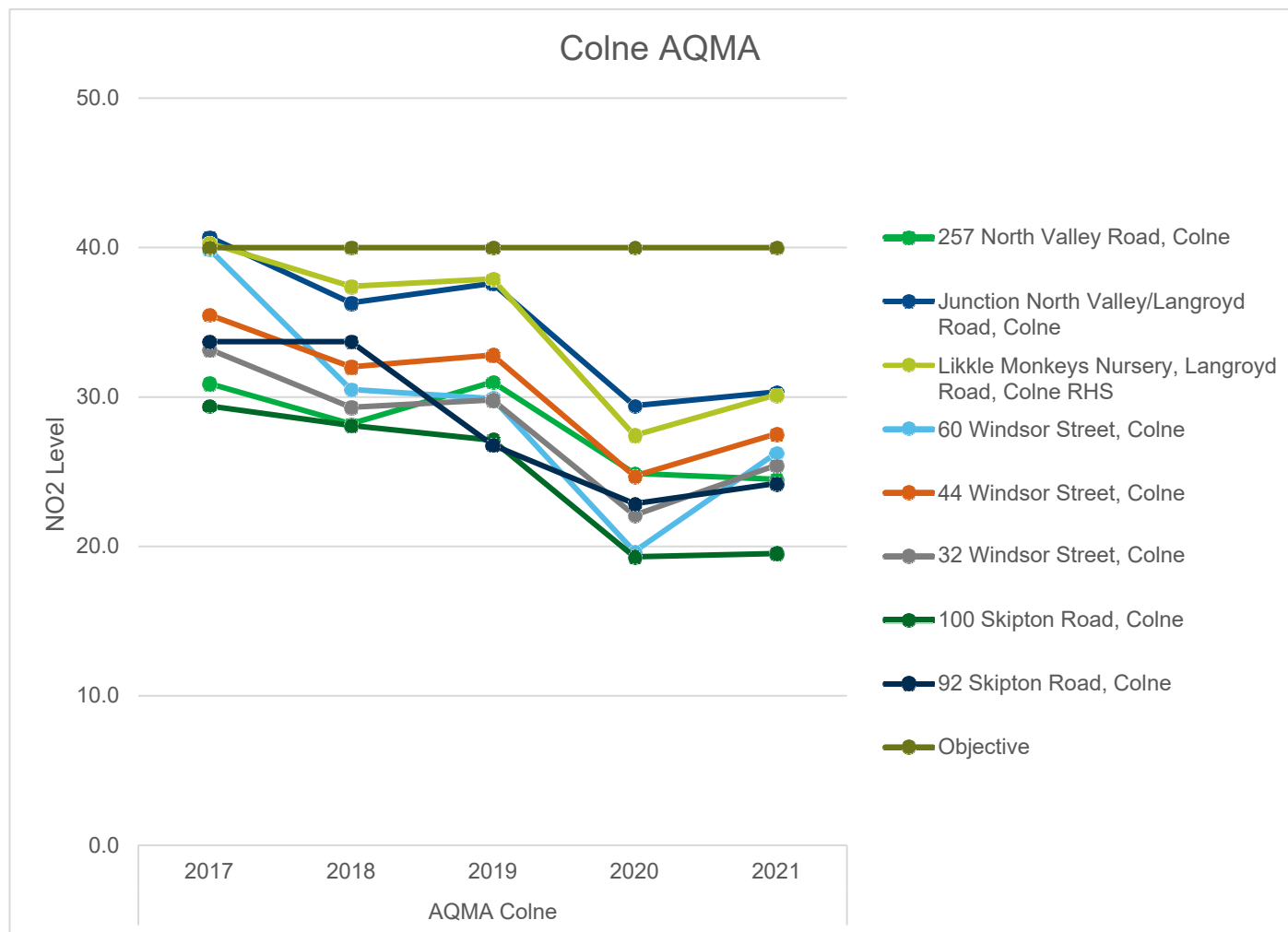
The annual mean concentrations are presented as µg/m³.

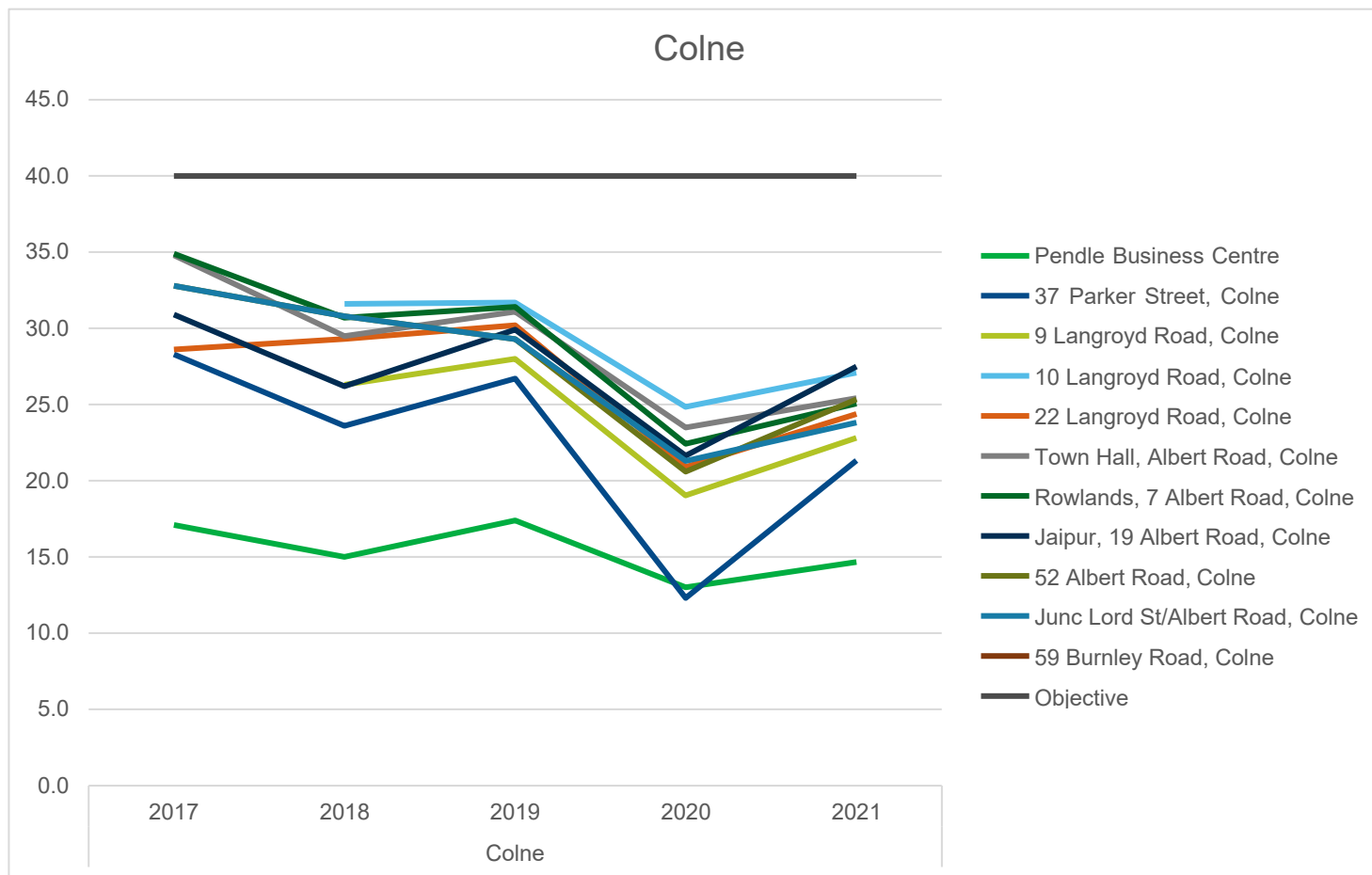
Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

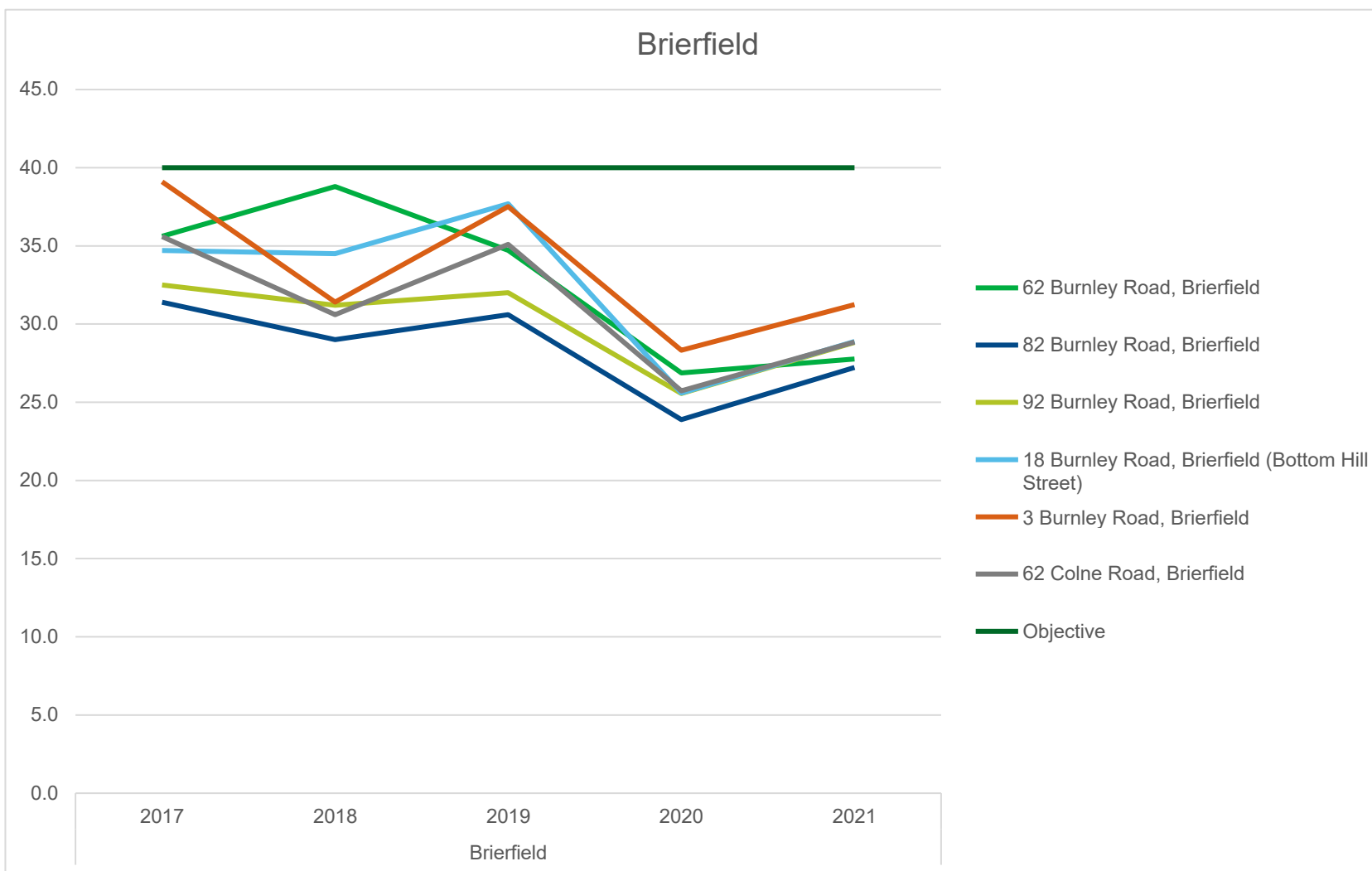
Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

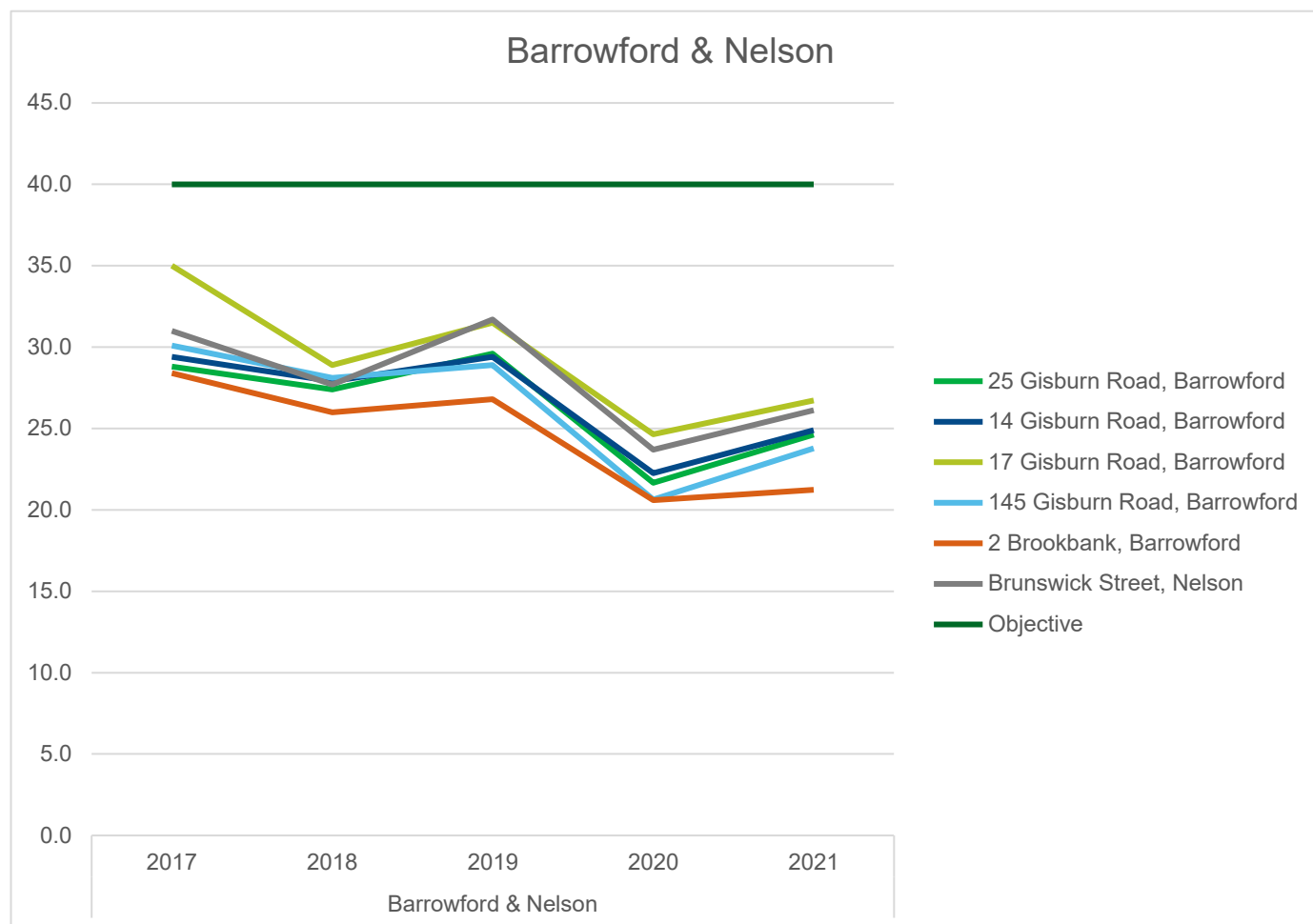
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations









Appendix B: Full Monthly Diffusion Tube Results for 2020 & 2021

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN28	386296	437592	24.4	20.1	10.6		9.4	10.5	11.0	12.2	14.7	19.7	26.0	24.4	16.1	13.0	-	
PEN13	386109	437634			21.4		21.0	28.1	23.0		27.5	34.9	33.6	45.3	28.7	24.1	-	
PEN14	386109	437634	43.2	33.3	20.2		22.6	27.2	22.9	24.0		35.0	36.8	34.6	28.8	23.3	-	
PEN17	384610	436118	42.1	33.4	23.4		23.5	31.9	27.1	32.4	39.1	39.3	42.3	42.4	33.2	26.9	-	
PEN72	384587	436098	34.2	30.9	19.8		18.9	27.4	21.3	28.0	32.8	36.9	41.8	42.8	29.5	23.9	-	
PEN73	384576	436006	38.2	33.0	23.4		22.5	32.1	23.2	33.4	38.8	38.1	45.0		31.6	25.6	-	
PEN99	384683	436357	35.8		23.6		26.2	30.1	25.4	34.0	38.7	31.2	39.2	40.6	31.6	25.6	-	
PEN91	384664	436365	45.5	40.4	22.6		31.4	27.6	29.4	33.9	38.4	38.3	37.1	43.0	33.9	27.5	-	
PEN92	384664	436365	45.3	41.7			28.1	26.4	30.3	31.4	38.5	41.1	37.8	39.7	36.0	29.2	-	
PEN93	384682	436650	42.1	38.4	21.5		24.3	27.4	28.8	28.8		38.0	41.3	39.0	31.6	25.6	-	
PEN94	384682	436650	41.6	39.1	21.6		23.4	26.5	26.6		37.6	38.4	42.2	36.5	31.9	25.9	-	
PEN11	385734	438965	37.7	32.0	18.3		17.5	20.8	20.0	23.7	30.6	33.1	37.6	36.8	27.0	21.9	-	
PEN12	385734	438965	30.3	30.2	16.7		17.3	22.9	21.2	23.7	30.9	34.5	36.4	38.4	26.4	21.4	-	
PEN74	385728	438925	33.2	27.4				23.3	17.6	22.4	27.6	32.9	27.7	34.1	27.5	22.2	-	
PEN75	385732	438936	46.8	35.4	19.9		21.9	24.9		25.7	32.7	36.5	40.5	35.5	30.4	24.6	-	
PEN95	385975	439719	33.6	28.7	18.5		18.6	<0.57	20.5	25.0	29.5	32.2	29.2	31.2	25.8	20.9	-	
PEN96	385975	439719	34.8	29.1	17.7		17.8	23.1	19.0	23.8	28.5	31.3	29.0	32.3	25.2	20.4	-	
PEN97	386101	439797	33.6	27.6	16.9			24.1	18.4	21.5	25.8	30.8	28.4	30.3	24.7	20.0	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN98	386101	439797	29.7	26.6				23.1	19.1	23.6	25.9	29.9	28.8	28.7	26.2	21.2	-	
PEN90	388138	440143			16.2		14.3	23.2		0.5			19.3	13.3	14.4	12.3	-	
PEN82	389061	440482	36.8				20.0	25.9	20.5	33.6	33.6	34.7	31.4	36.6	30.6	24.8	-	
PEN83	389061	440482					19.7	26.9	19.7	32.3	32.9	31.6	36.3	38.5	30.1	25.0	-	
PEN84	389079	440492	53.2				26.9	31.5	28.6		40.3	42.3	45.2	41.0	38.7	28.8	-	
PEN85	389079	440492	49.1	45.8	25.6		25.2	33.1	28.1	27.1	<0.64	72.9	41.5	39.6	37.0	30.0	-	
PEN76	389081	440519	33.5		16.3			19.5	18.6	21.5	27.5	28.4	32.9		23.3	20.0	-	
PEN77	389081	440519	31.4	17.3	16.9			20.2	18.3	21.6	23.7	27.6	32.7		22.3	18.1	-	
PEN78	389098	440508	39.2		21.0		21.6	31.5	20.9	29.9	36.4	38.1	39.4	34.1	30.0	24.3	-	
PEN79	389098	440508	40.0	32.8	22.0		22.3	31.3		31.7	34.1	36.4	36.7	38.0	31.4	25.4	-	
PEN36	389102	440540	28.4	28.4	19.5		19.3	28.3	16.6	24.8	27.7	29.9	33.5	34.0	25.8	20.9	-	
PEN86	389105	440484	38.6	39.1	24.2			32.5	22.1	35.4	38.5	41.2	40.5	42.5	34.2	27.7	-	
PEN87	389105	440484	41.1		23.6			33.6	25.1	33.0	43.7	40.1	40.1	35.9	33.5	27.1	-	
PEN65	389159	440488	32.3		21.6		21.8	25.8	21.7	29.9	35.8	32.0	8.2	4.0	22.6	18.3	-	
PEN66	389159	440488	3.5		21.6		23.2		24.0	28.4	37.5		39.3	35.6	26.2	21.0	-	
PEN67	389207	440484	33.8	34.2	20.5		21.3	25.1	25.7	27.1	32.8	36.5	39.3	39.3	29.5	23.9	-	
PEN68	389207	440484	35.2	32.8			22.9	26.2	27.3	29.5	38.1	28.5	37.7	36.1	31.5	25.5	-	
PEN69	389250	440482	32.5	28.6	19.8		18.6	23.5	21.4	25.6	31.7	33.5	34.6	36.5	27.1	21.9	-	
PEN70	389250	440482	33.4	33.6	18.7		19.7	24.1	21.4	27.8	33.1	32.2	36.5	32.9	27.5	22.2	-	
PEN63	389425	440490	30.7				17.7	11.7	17.0	24.7	25.2	29.3	31.7	18.4	22.7	18.4	-	
PEN64	389425	440490	19.3	33.1	23.6		18.4	20.2	17.6	24.8	29.2	25.2	32.0	31.2	24.9	20.2	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.81)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN3	389410	440463	31.6	28.4	17.9		19.4	24.8	21.4	25.4	30.5	30.6	35.1	33.6	26.2	21.2	-	
PEN4	389410	440463	39.5		20.0		18.8	23.8	21.1	24.2	29.1	31.8	34.7	35.4	27.0	21.8	-	
PEN54	389410	440463	36.6	31.5	20.1		18.9	22.2	21.4	25.4	30.8	32.5	35.5	34.9	27.3	22.2	-	
PEN5	388820	440045			20.0				24.2	26.4	33.8	32.6			25.7	25.2	-	
PEN6	388820	440045		31.3	20.1				24.9	27.3		34.2	35.7		27.1	23.3	-	
PEN71	388755	440026	32.4	30.7				28.2	25.3	26.5		31.4	35.7		29.9	23.7	-	
PEN47	388711	439999	35.9	36.6	22.0		20.9	27.5				35.1	36.0	34.5	29.8	22.4	-	
PEN46	388655	440002	30.9	28.9	19.5			22.6		25.0	31.1	31.1	31.8	30.3	26.7	21.6	-	
PEN7	388389	439924	35.9		16.4		15.8	22.2	20.6		27.8	32.0	37.5	32.2	25.4	20.6	-	
PEN8	388389	439924	35.2		17.0		15.7	22.1	21.3		25.1	32.8	35.0	27.4	24.6	19.9	-	
PEN50	387922	439500	38.3	34.1	20.5		18.5	25.1	22.8	24.9	33.5	31.8	35.9	33.5	28.0	22.7	-	

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

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN28	386296	437592		20.0	16.2			12.4	13.1	12.5	16.7	20.0	25.9	19.7	17.5	14.7	-	
PEN13	386109	437634		32.1	27.6	33.1	26.8	29.8	28.1	24.3		36.4	38.0	32.9	30.7	25.8	-	
PEN14	386109	437634		31.2	32.9	33.6	27.2	29.2	31.7	27.6		38.1	39.2	26.2	31.5	26.4	-	
PEN17	384610	436118		35.0	28.9	40.9	35.3	34.0		26.2	23.9	39.1	37.3	32.7	33.1	27.8	-	
PEN72	384587	436098		35.1	26.8	37.4	29.0	27.7	28.2	33.2	34.4	39.3		34.9	32.4	27.2	-	
PEN73	384576	436006			28.4	47.9	28.7	32.5	30.8	31.2	34.9	40.8	38.5	35.2	34.3	28.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN99	384683	436357		35.1	28.8	42.9	29.1	34.1	34.4		36.0	35.4	38.6	32.9	34.4	28.9	-	
PEN91	384664	436365		34.8	35.2	44.2	35.0	36.1	38.5	29.7	39.9	37.0	44.4	33.1	36.8	30.9	-	
PEN92	384664	436365		33.8	36.3	43.6	31.8	37.7	39.4		41.1	37.7	43.4	35.6	37.5	31.5	-	
PEN93	384682	436650		33.4	31.1	41.2	29.3	30.3	36.1	26.4	35.9	39.9	42.7	34.5	34.2	28.7	-	
PEN94	384682	436650		32.5	31.4	39.3	32.3	31.2	32.3	27.4	36.7	40.9	45.1	34.3	34.5	29.0	-	
PEN11	385734	438965		31.8	26.9	32.8	25.5	26.2	25.7	23.7		35.5	38.0	29.8	29.5	24.7	-	
PEN12	385734	438965		31.7	25.7	32.2	27.3	24.3	25.5	24.4	28.8	34.9	37.7	29.4	29.2	24.5	-	
PEN74	385728	438925		33.6	23.6	33.5	26.3	25.1	25.4	24.7	28.6	32.6	42.5	31.0	29.6	24.9	-	
PEN75	385732	438936		32.2	29.7	33.9		29.2	27.0	27.2	32.2	39.2	35.6	33.2	31.8	26.7	-	
PEN95	385975	439719		30.6	25.3	34.3	24.1	24.1	25.1	25.0	28.3	32.9		32.8	28.1	23.6	-	
PEN96	385975	439719		29.7	24.4	32.9	26.0	25.5	25.5		27.8	31.7	34.4	29.9	28.5	24.0	-	
PEN97	386101	439797		28.1	23.1	26.8	23.9	23.7	23.5	23.3	26.0	29.9	29.1	26.0	25.7	21.6	-	
PEN98	386101	439797		25.5	23.3	28.8	23.2	23.6	21.8	22.6	19.4	29.6	30.8	27.1	24.8	20.8	-	
PEN90	388138	440143			14.3	16.5	24.0			20.8	30.1	36.9	36.3	32.1	26.0	21.3	-	
PEN82	389061	440482		28.1	17.5	36.2	25.5	24.8	26.0	24.6	32.6	34.0	34.3	31.7	28.2	23.7	-	
PEN83	389061	440482		33.1	26.7	36.3	23.6	24.3	27.3	26.4	32.6	33.5	35.6	33.1	30.1	25.3	-	
PEN84	389079	440492		36.9	35.3	37.3	33.6	29.4	35.1	29.9	36.1	37.0	44.7	39.0	35.7	30.0	-	
PEN85	389079	440492		34.6	37.8	38.1	35.4	30.0	34.2	30.8	36.8	39.4	45.9	40.8	36.5	30.6	-	
PEN76	389081	440519		19.5		32.9	25.9	24.8	28.4	21.1	26.7	33.3	34.6	31.1	27.0	22.7	-	
PEN77	389081	440519		26.8	25.0	33.4	24.6	21.1	30.3	23.4	26.9	30.8	35.9	26.4	27.3	22.9	-	
PEN78	389098	440508		34.2	31.5	40.4	27.3	27.9	24.5	30.6	31.1	35.1	35.7	36.2	32.0	26.9	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN79	389098	440508		34.1	31.0	38.3	28.4	28.5	23.5	30.3	32.5	36.8	37.8	37.7	32.4	27.2	-	
PEN36	389102	440540		32.0	25.0	37.6	28.8	24.9	23.8	28.5	26.1	27.8	33.0	32.8	29.0	24.4	-	
PEN86	389105	440484		37.2	36.9	46.0	31.5	32.6	35.4	33.7	35.4	36.5	41.4	40.2	36.7	30.8	-	
PEN87	389105	440484		29.4	31.3	44.2	33.0	32.6	33.9	32.4	37.1	41.2	42.6	35.7	35.1	29.4	-	
PEN65	389159	440488		14.6	29.2	16.9	29.1	29.0		28.8	30.6	32.6	35.1	35.8	27.4	23.0	-	
PEN66	389159	440488			31.6	40.3	29.6	27.7		27.6	33.7	28.6	41.3		32.3	29.5	-	
PEN67	389207	440484		33.5	30.7	39.9	30.2	28.4		28.5	35.1		43.9	31.7	33.3	28.0	-	
PEN68	389207	440484		32.4	28.5	39.4	30.0	27.4		28.1	37.0	34.8		34.9	32.3	27.1	-	
PEN69	389250	440482		30.0	27.6	37.3	26.5	27.0		26.0	33.1	30.8	35.8	33.9	30.5	25.6	-	
PEN70	389250	440482		31.5	26.3	34.4	28.2	26.0		26.9	29.8	33.6	36.6	29.0	30.1	25.2	-	
PEN63	389425	440490		20.4	22.4	33.6	26.2	12.6		24.9	30.9	12.0	32.6	10.1	22.6	19.0	-	
PEN64	389425	440490		21.4	21.8	31.3	27.3	23.8		26.7	28.0	13.9	33.5	10.4	23.9	20.0	-	
PEN3	389410	440463		21.3		30.1	24.8	24.7		26.3	27.7	32.1	37.9	31.6	27.7	23.2	-	
PEN4	389410	440463				32.3	28.2	24.9		25.7	26.7	32.1	37.0	33.0	29.7	25.1	-	
PEN54	389410	440463			25.2	31.7	26.9	25.6		27.3	25.1	34.6	37.0	31.1	28.9	24.3	-	
PEN5	388820	440045			27.7		30.2	31.5	32.5	32.7	27.9	30.7	37.6	31.3	31.1	26.1	-	
PEN6	388820	440045		19.4	26.8	42.0	29.6	34.6	30.3	30.4	30.2	30.8			29.4	24.7	-	
PEN71	388755	440026		22.7	26.1	29.8	30.8	28.9	30.7	26.5	32.8	35.0	37.6	33.5	29.8	25.1	-	
PEN47	388711	439999		33.8	26.1	30.8	32.8	28.9	31.6		34.3	35.2	38.0	36.8	32.7	27.5	-	
PEN46	388655	440002		27.6	24.7	36.2	30.7	30.6	29.2	29.9	28.8	28.7	39.5	30.1	30.2	25.3	-	
PEN7	388389	439924		28.5	22.8	27.5	26.4	25.6	25.4	22.6	30.7	34.0	36.3	32.8	28.2	23.7	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.84)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
PEN8	388389	439924		29.5	23.6	25.6	26.0	25.1	25.7	22.0	30.2	34.6	38.8	33.6	28.5	23.9	-	
PEN50	387922	439500		29.3	26.6	28.3	29.6	23.7	29.6	23.7	50.2	37.6	36.3	33.6	31.7	26.6	-	

X All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1 & B.2.

X Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.

X National bias adjustment factor used.

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

X Pendle Borough Council confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

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**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Pendle Borough Council During 2020 & 2021

Pendle Borough Council has not identified any new sources relating to air quality within the reporting year of 2020 & 2021.

Additional Air Quality Works Undertaken by Pendle Borough Council During 2020 & 2021

Pendle Borough Council has not completed any additional works within the reporting year of 2020/2021

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used by Pendle Borough Council were supplied and analysed by Gradko Environmental Ltd, using a 20% TEA / Water solution. Tubes were prepared and analysed by the inhouse laboratory which is UKAS accredited (ISO: 17025). The Air Quality Review and Assessment website provided a bias adjustment figure of 0.81 for the 2020 data set and 0.84 for the 2021 data set.

No co-location study has been undertaken by Pendle Borough Council, and so the national bias adjustment figured derived from the table below has been used to adjust all results obtained by Pendle Borough Council.

The results of the AIR NO₂ Proficiency Testing Scheme and a field inter-comparison exercise, precision survey indicated a good overall level of precision with collocated studies for the Gradko diffusion tubes for both the 2020 & 2021 dataset.

The diffusion tube monitoring program has been completed generally in line with the Diffusion Tube Monitoring Calendar, however over March/April 2020 tubes were not changed and the monitoring programme was placed on hold due to the Covid Pandemic. At the end of the year the December tubes were not changed until the end of January due

to staffing shortages within the department. In 2021 with the exception of the January period the calendar was followed.

QA/QC data from the AIR-PT scheme identified a 75% satisfactory level for Gradko, with two nationally cancelled rounds due to Covid. In 2021 the first session reported a 25% satisfactory result over January -February, no monitoring was undertaken by Pendle Borough Council in January 2021, with a 100% satisfaction rate for the rest of the year.

Diffusion Tube Annualisation

A number of monitoring locations over both the 2020 and 2021 data set recorded data capture below 75%. As such annualisation of these results was undertaken using the Diffusion Tube Data Processing Tool. Continuous monitoring data from Preston, Blackburn and Blackpool automated monitoring stations has been utilised to undertake this annualisation. The sites for which annualisation of the results was undertaken are shown in Table C.2 & Table C.3:

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Pendle Borough Council have applied a national bias adjustment factor of 0.81 to the 2020 monitoring data and 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used by Pendle Borough Council over the past five years is presented in Table C.1. The latest version of the national spreadsheet, September 2022 version 09/22, has been used to obtain the bias adjustment figure used.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	09/22	0.84
2020	National	09/22	0.81
2019	National	03/20	0.91
2018	National	03/19	0.92
2017	National	03/18	0.87

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1 & B.2.

According to the new Diffusion Tube Data Processing Tool no diffusion tube monitoring locations within Pendle Borough Council required distance correction during 2020 or 2021.

Table C.2 – Annualisation Summary 2020 (concentrations presented in $\mu\text{g}/\text{m}^3$)

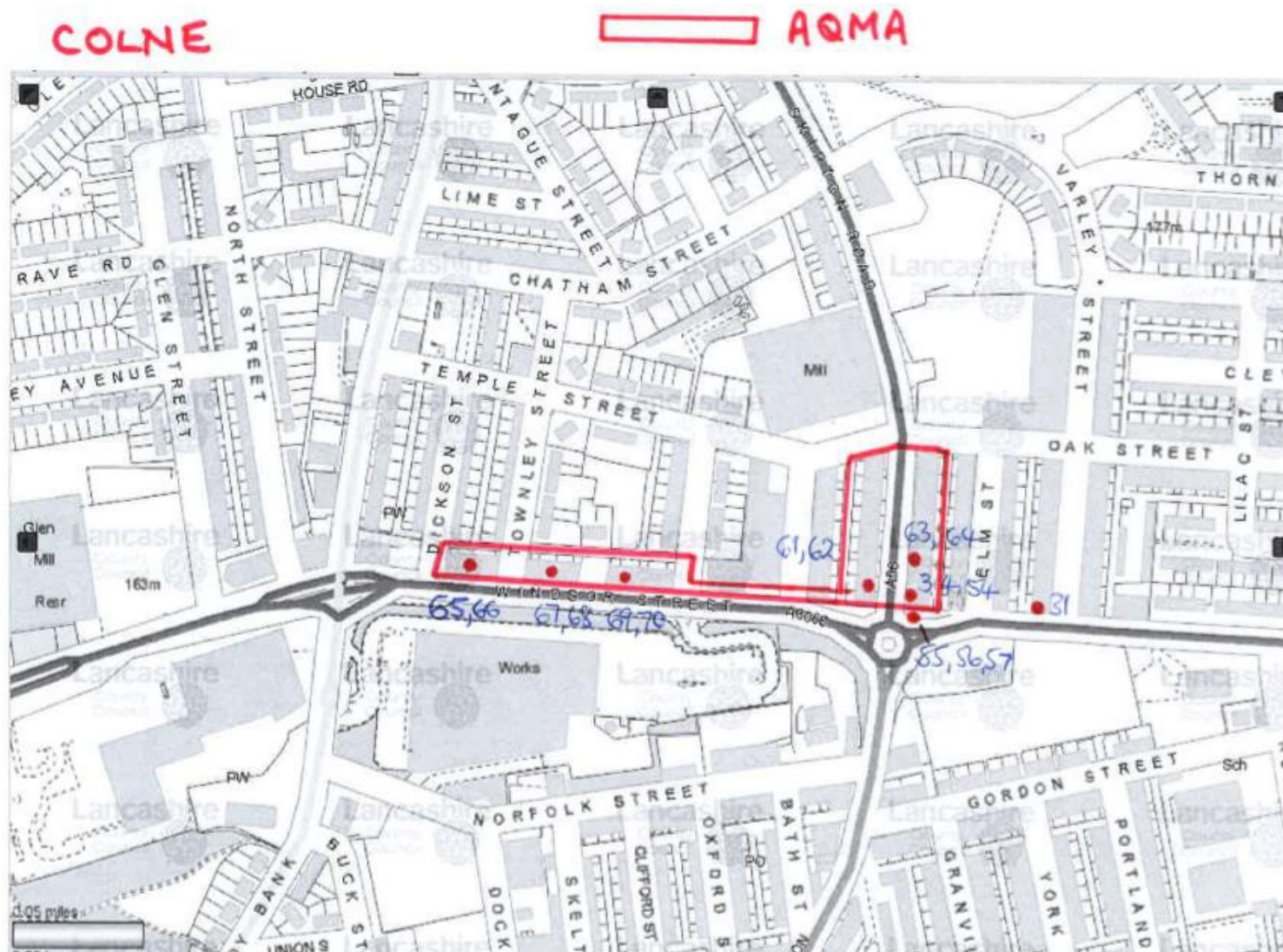
Site ID	Annualisation Factor Blackburn	Annualisation Factor Preston	Annualisation Factor Blackpool	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
PEN13	1.0214	1.0343	1.0545		1.0368	28.7	29.8	
PEN90	1.0472	1.0642	1.0584		1.0566	14.4	15.2	
PEN83	0.9967	1.0375	1.0342		1.0228	30.1	30.8	
PEN84	0.9255	0.9198	0.9165		0.9206	38.7	35.6	
PEN76	1.0475	1.0705	1.0555		1.0579	23.3	24.7	
PEN66	0.9937	0.9926	0.9822		0.9895	26.2	25.9	
PEN5	1.1671	1.1985	1.2721		1.2126	25.7	31.1	
PEN6	1.0371	1.0863	1.0613		1.0616	27.1	28.8	
PEN71	0.9717	1.0008	0.9566		0.9763	29.9	29.2	
PEN47	0.9471	0.9204	0.9208		0.9294	29.8	27.7	

Table C.3 – Annualisation Summary 2021 (concentrations presented in $\mu\text{g}/\text{m}^3$)

Site ID	Annualisation Factor Preston	Annualisation Factor Blackburn	Annualisation Factor Blackpool	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
PEN90	0.9667	0.9814	0.9758		0.9746	26.0	25.4	
PEN66	1.0564	1.0648	1.1355		1.0856	32.3	35.1	
PEN4	1.0015	0.9997	1.0201		1.0071	29.7	29.9	

Appendix D: Map(s) of Monitoring Locations and AQMAs

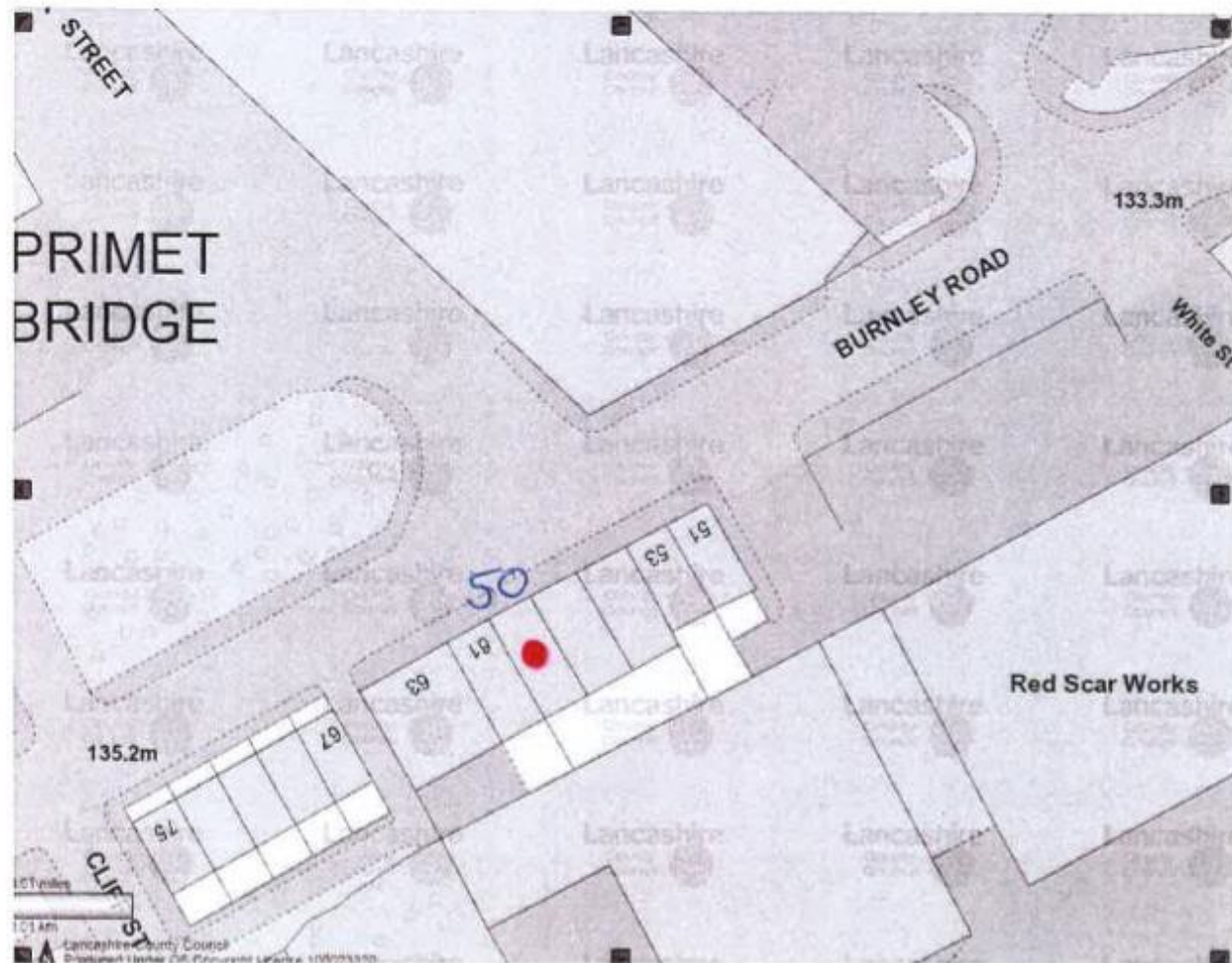
Figure D.1 – Map of Non-Automatic Monitoring Site

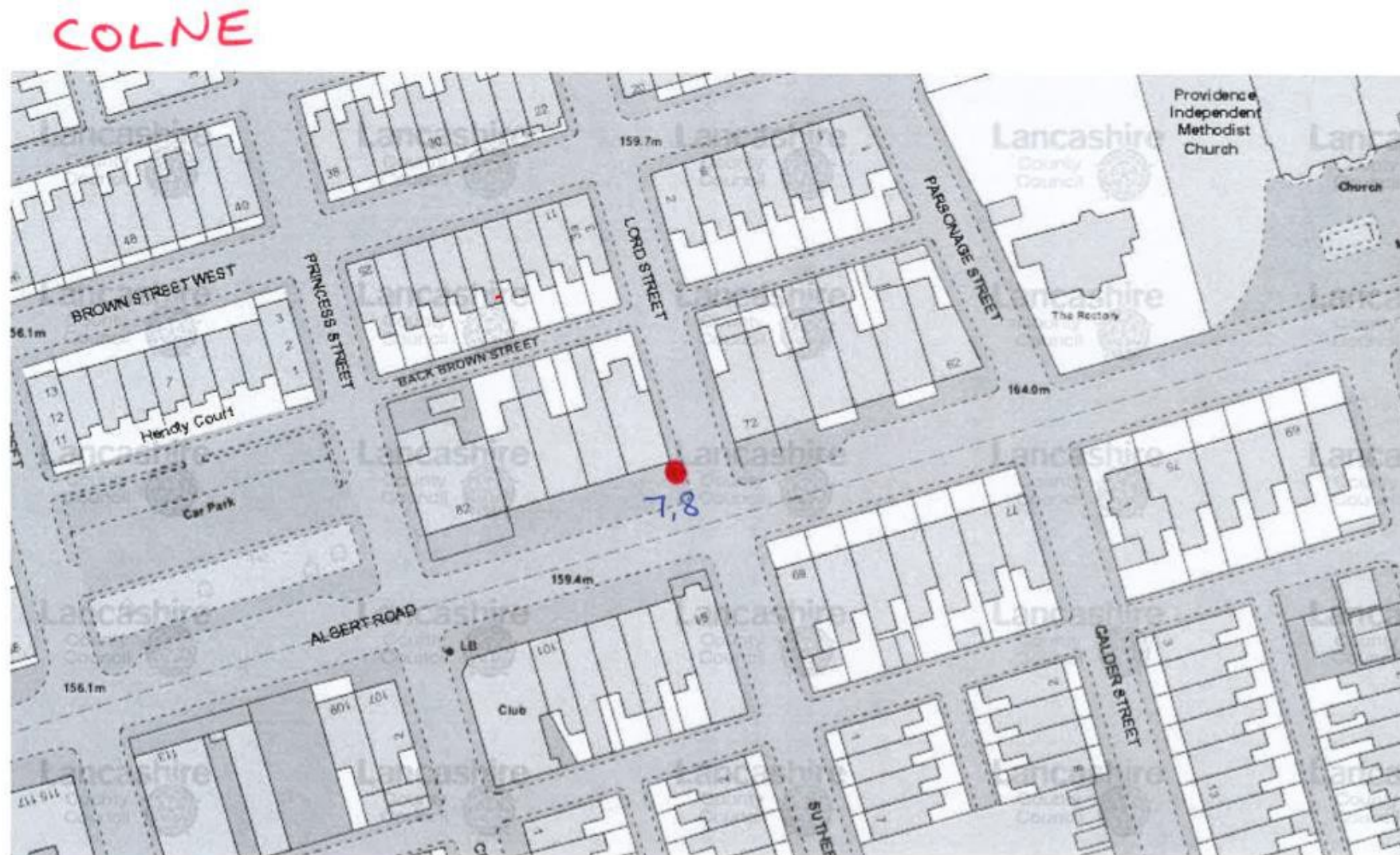


COLNE



COLNE





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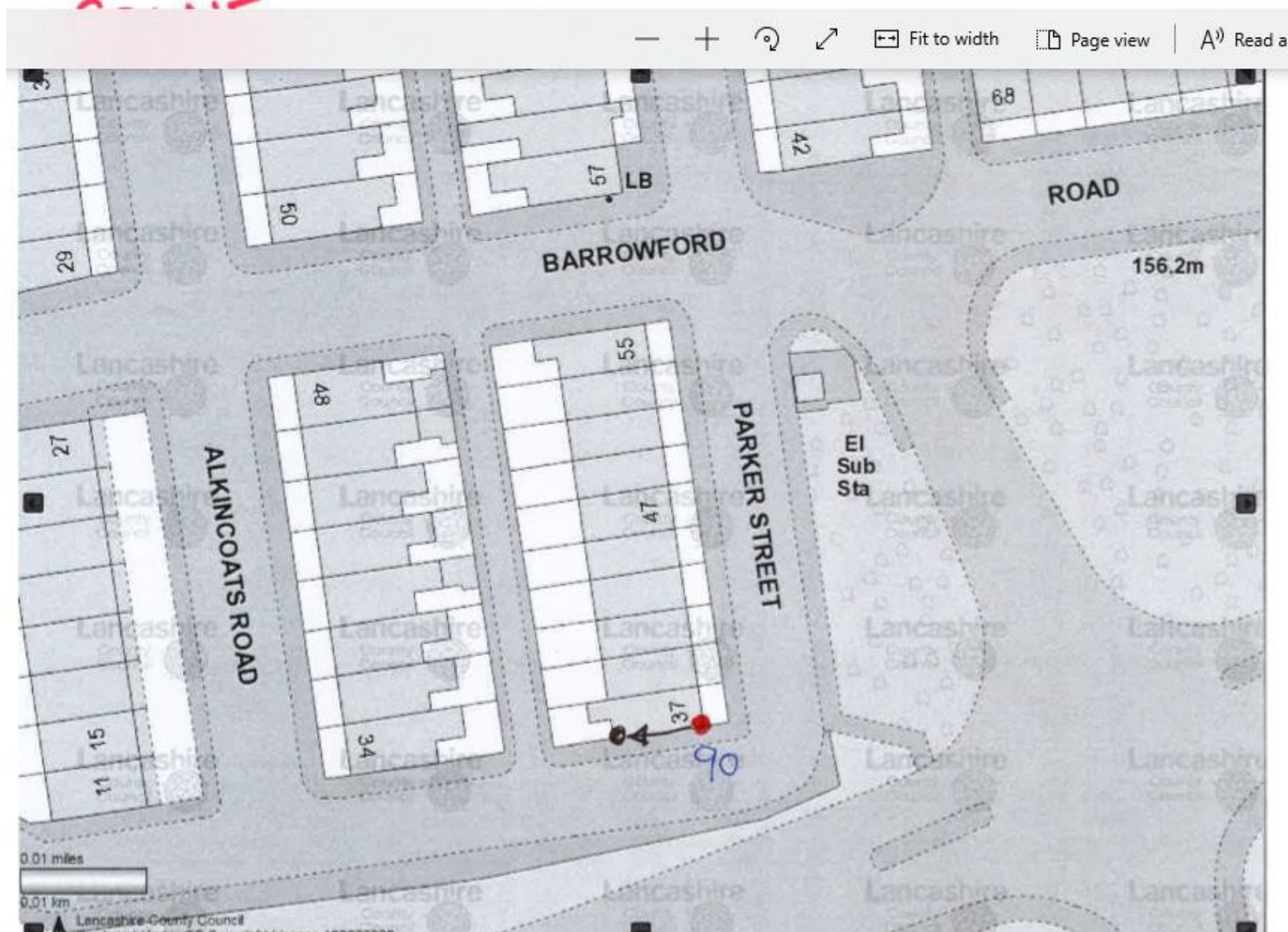
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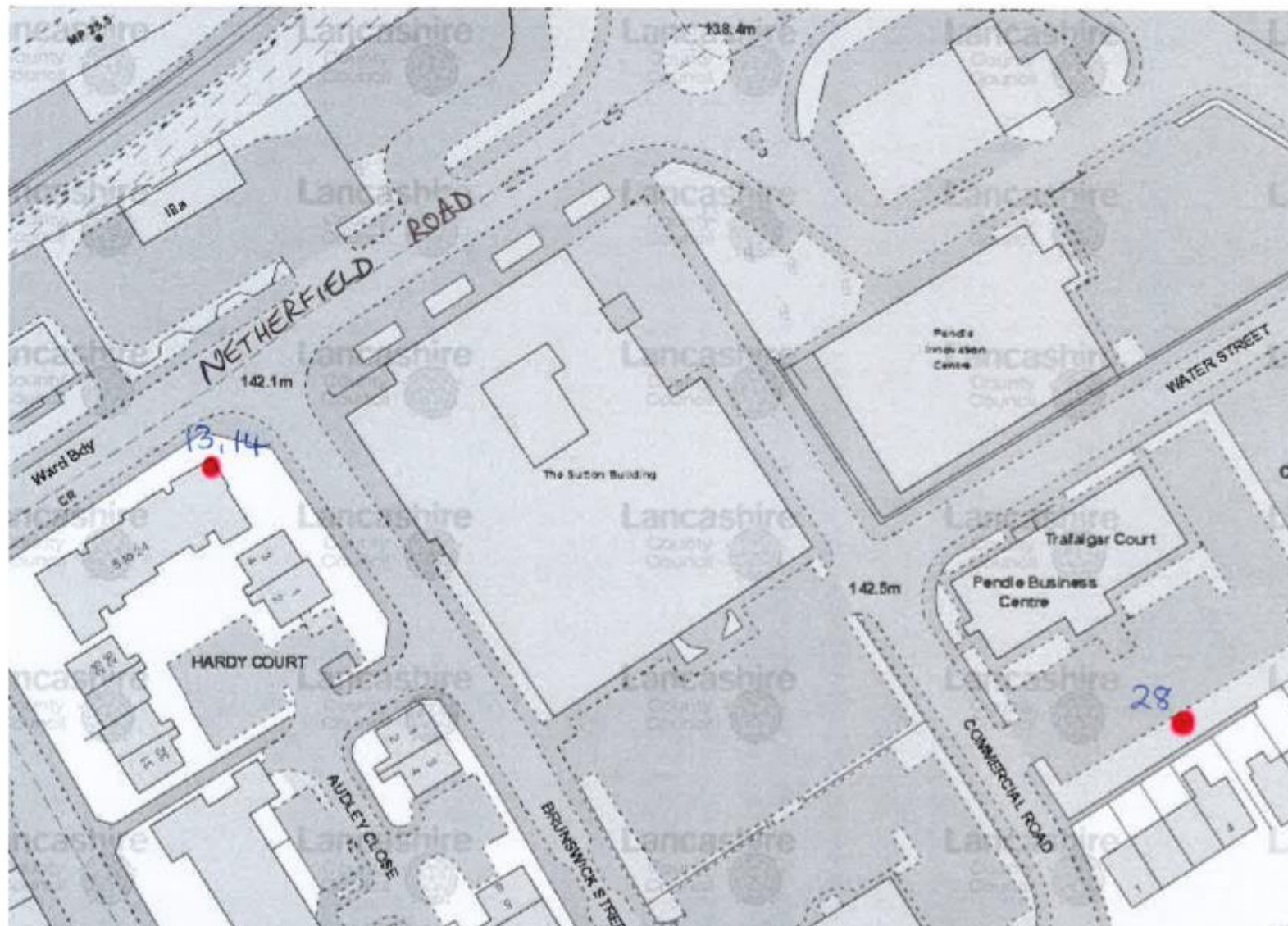
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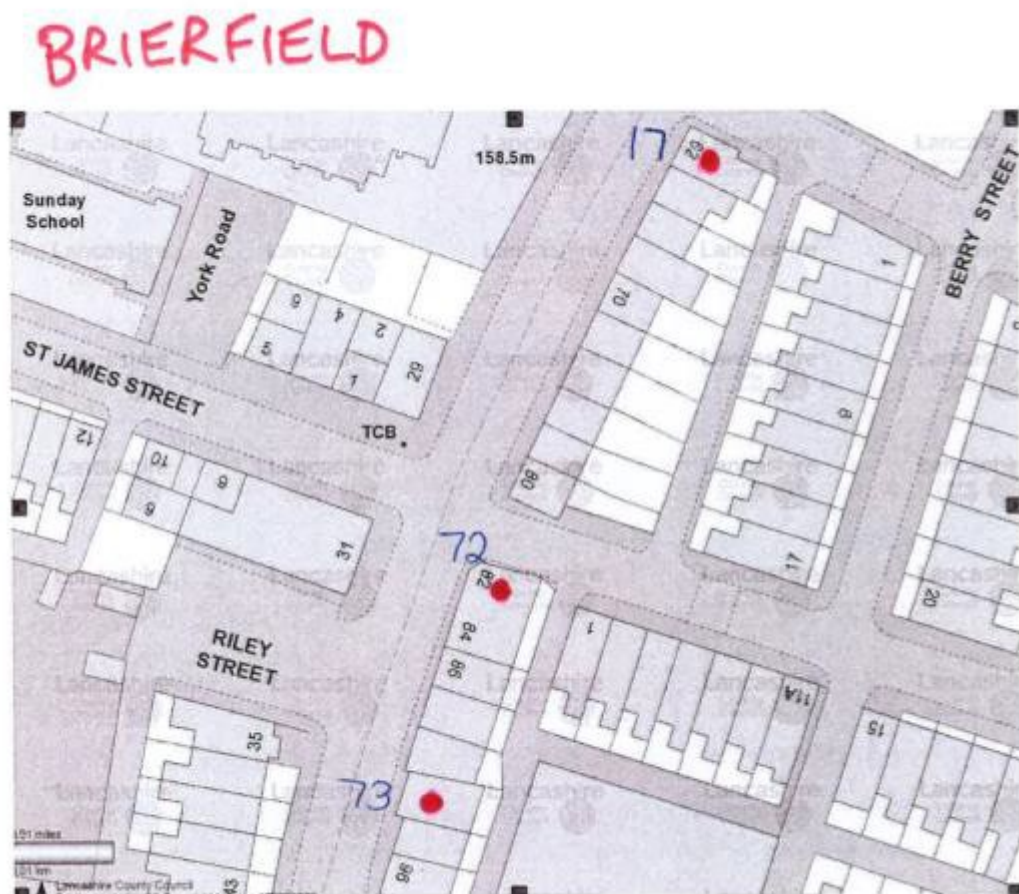


NELSON



BRIERFIELD



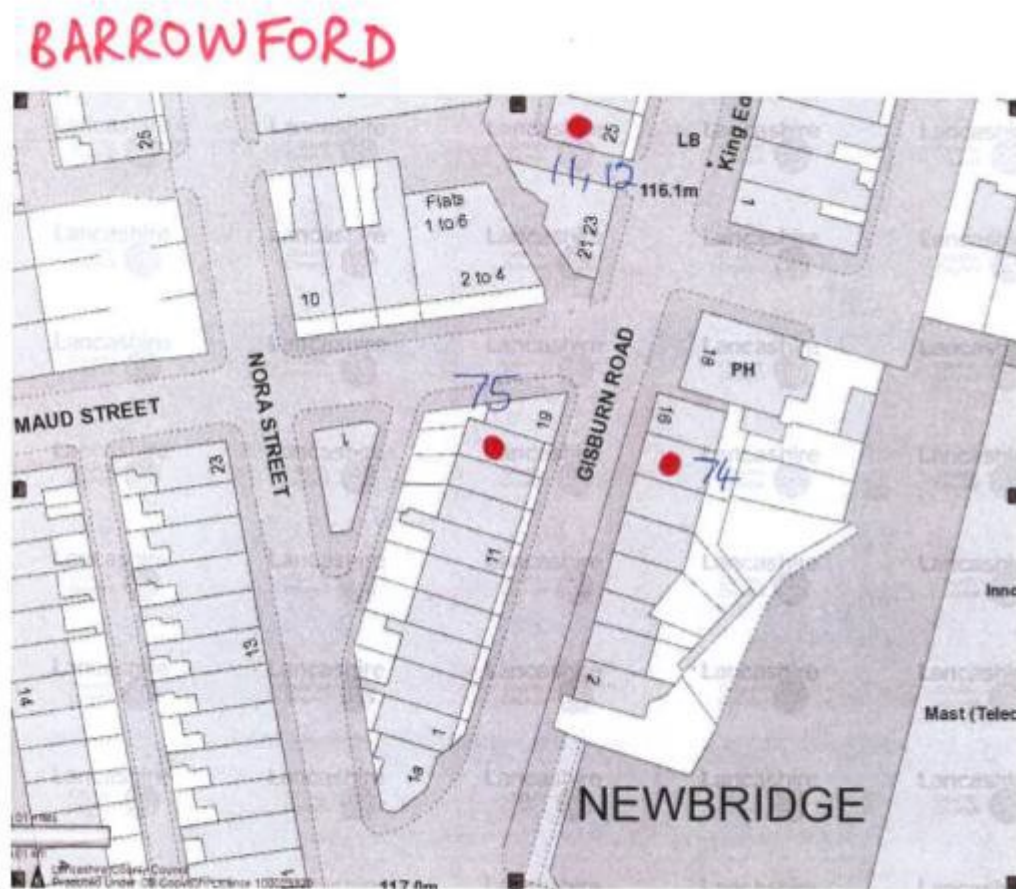


BRIERFIELD

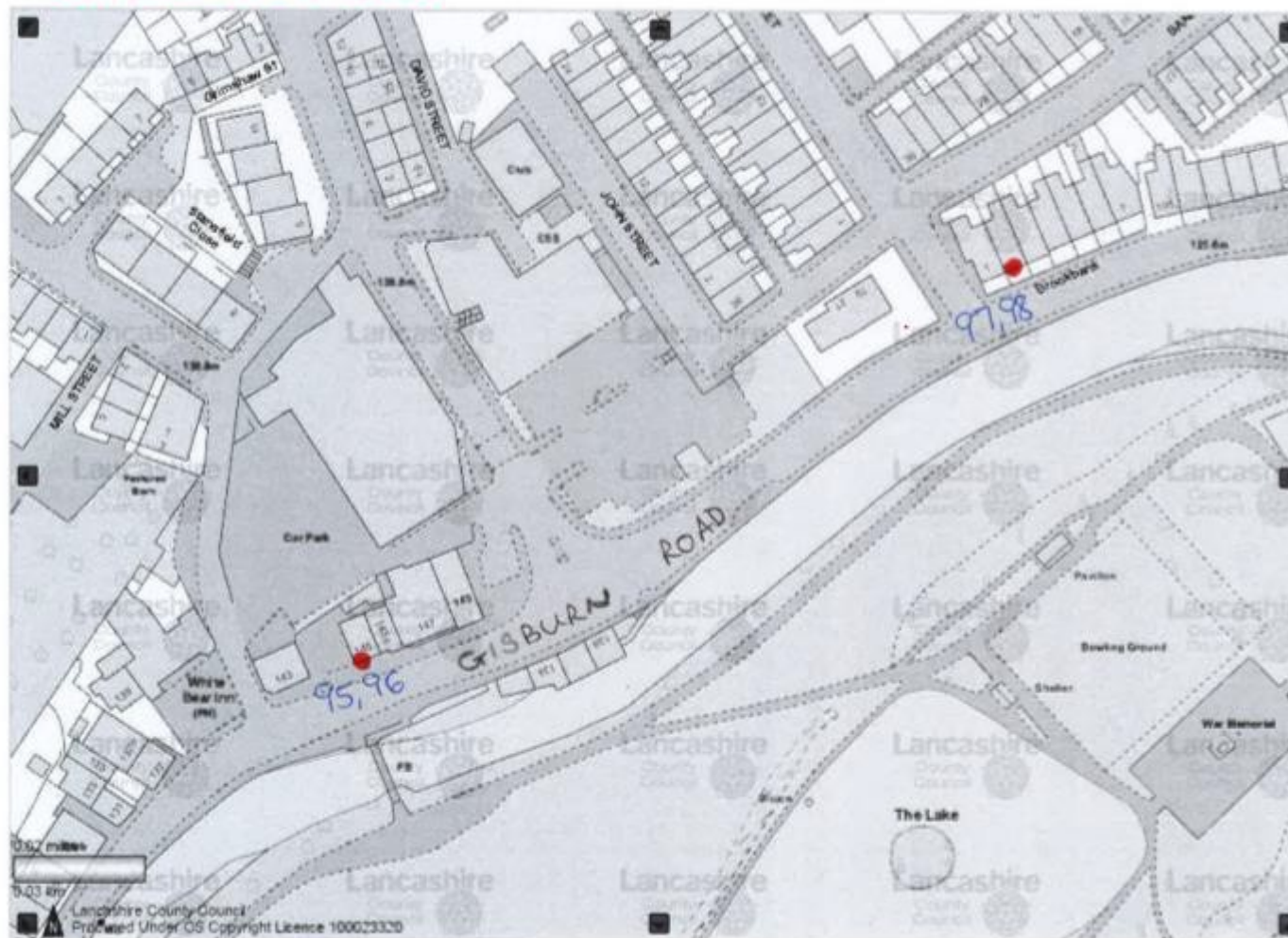


BRIERFIELD





BARROWFORD



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁸

Pollutant	Air Quality : Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO ₂)	40µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM ₁₀)	40µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO ₂)	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO ₂)	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁸ The units are in micrograms of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority 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
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
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 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

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.