



# 2022 Air Quality Annual Status Report (ASR)

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

Date: June, 2022

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# Executive Summary: Air Quality in Our Area

## Air Quality in Chorley 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 as evidence shows areas with poor air quality are also often less affluent areas<sup>1,2</sup>.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages<sup>3</sup>, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017<sup>4</sup>.

The principal pollutants of concern within Chorley are those associated mainly with traffic, these being Nitrogen Dioxide, and Particulate Matter. The Council currently 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 but are now stabilising. This is likely due to the lessening effect of the Covid-19 pandemic on traffic flows during 2021, coupled with the gradual reopening of businesses and schools etc. towards the end of the monitoring period. The results from 2021 show no areas of exceedance or near exceedance of the national objectives within the borough.**

However, given the continual evidence identifying the harmful effects of both Particulate Matter and Nitrogen Dioxide, along with the Council's commitment to work with partners on the public health agenda, the Council's duties under the Local Air Quality Management

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<sup>1</sup> Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2021

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

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 Chorley 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 a Clean Air Strategy.

## 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 Strategy<sup>5</sup> sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero<sup>6</sup> 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.

Chorley Council has over the previous 12 months again reviewed the Nitrogen Dioxide monitoring locations. This has resulted in some previous monitoring locations being dropped from the monitoring programme due to the distance from sensitive receptors, and 29 new sites being added to the programme.

The Council opened the Clean Air Strategy to public consultation, and the results reviewed to create a revised version of the strategy, to be adopted in 2022.

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

- Publish the updated Clean Air Strategy
- Continuing with the diffusion tube monitoring programme
- Review the performance of continuous air quality Zephyr trial
- Continue to consider air quality for all relevant planning applications

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<sup>5</sup> Defra. Clean Air Strategy, 2019

<sup>6</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- Continue to liaise with colleagues across the Council and with South Ribble and Preston City councils to develop the revised Central Lancashire Local Plan
- The development 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
- Encourage greater use of public transport and alternative forms of travel, including the provision of electric vehicle recharging points through the planning system
- We will continue to carry out the inspections and enforcement of permitted premises within the borough under the Environmental Permitting Regulations
- Through the Climate Emergency work we will continue to embed air quality actions and improvements through the Council's operations
- Working with third sector partners to encourage active travel and make our greens spaces more inviting
- 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

## 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 existing monitoring locations have shown a stabilisation in Nitrogen Dioxide concentrations on previous years. New monitoring sites do not yet have sufficient data to draw a conclusion.

As a priority over the coming months the Council will continue to work with partner organisations, the County Public Health team, and other local authorities on the implementation of the county wide guidance document for planning. The document is required to ensure all developments adequately address air quality impacts.

In addition, the Council will be relaunching the Clean Air Strategy to drive forward air quality improvements throughout the borough. Monitoring locations will also continually be reviewed across the borough to maintain their relevance.

## Local Engagement and How to get Involved

Chorley Council welcome scrutiny and suggestions from our residents regarding our Air Quality monitoring programme. If you would like to get involved in the work to tackle air pollution within Chorley Borough; or if you would like more information on how you can help reduce your personal emissions, then please contact the Environmental Health Department at Chorley Council on 01257 515151 or via e-mail at [contact@chorley.gov.uk](mailto:contact@chorley.gov.uk).

Air Quality is an issue that everyone can take responsibility for and make small changes to achieve improvements. Further information is available on the Council's website, using this [link to the Air quality webpage](#).

Keep an eye open for forthcoming Chorley Council consultations where you voice your opinion on air quality, climate change and more by visiting our online consultation portal, [link to Citizen Space](#). Our social media pages also regularly suggest ways we can all minimise our air quality impact.

Lancashire County Council has many cycle routes that can be used for commuting as well as leisure purposes. More information can be found on their website:

<http://www.visitlancashire.com/cycling-lancashire>

There is also a wealth of information on public transport:

<http://www.lancashire.gov.uk/roads-parking-and-travel/public-transport.aspx>

And alternative ways to travel:

<http://www.lancashire.gov.uk/roads-parking-and-travel/alternative-ways-to-travel.aspx>

## Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Chorley Council with the support and agreement of the following officers and departments:

Spatial Planning

This ASR has been approved by:

**Signature:**

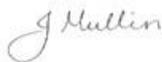
**Endorsed By:** Gary Hall, Chief Executive Chorley Council

**Signature:**



**Endorsed By:** Jennifer Mullin, Director of Communities

**Signature:**



**Endorsed By:** Dr Sakthi Karunanithi, Director of Public Health

This ASR has not been signed off by a Director of Public Health.

If you have any comments on this ASR, please send them to Chorley Council Environmental Health at:

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# 1 Local Air Quality Management

This report provides an overview of air quality in Chorley Council during 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 Chorley 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**

### **2.1 Air Quality Management Areas**

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority 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.

Chorley Council currently does not have any declared AQMAs.

## 2.2 Progress and Impact of Measures to address Air Quality in Chorley

Defra's appraisal of last year's ASR concluded that the report was well structured, detailed, and provides the information specified in the Guidance. The following comments were provided to help inform future reports:

- Further detail on how the annualisation factors were calculated for each of the comparison AURNs along with the full names of the AURN sites used would be appreciated.
- The report refers to the Public Health Outcomes Framework and the local indicator for PM2.5 in the district, comparing it to the regional and national indicator values.
- It is promising that the council plan to purchase continuous monitoring equipment in the coming year. Hopefully, this can be set up with a triplicate diffusion tube site to produce a local bias adjustment factor.
- A couple of formatting errors exist in the report: "all tubes were <75% data capture" and "an exceedance of the 1-hour mean objective is likely". This is a potential source of confusion for the reader.
- Distance correction was carried out for all sites; however, this is only required for sites recording an annual mean NO<sub>2</sub> concentration >36 µg/m<sup>3</sup>
- Council have provided a clear map of the diffusion tube monitoring network; trends are displays and discussed in the report, this is welcomed.
- The Council have provided good discussion on whether NO<sub>2</sub> decreases in the area seen in 2020 as a result of the Covid-19 pandemic fit the national trend of a 20% reduction.
- It is welcomed that the council provide a thorough consideration of diffusion tube locations to continuously try and find new hotspots of high concentrations and have introduced new sites for 2020.

Chorley Council has taken on-board the comments from the previous ASR submission and progressed several direct measures during the current reporting year of 2021 in pursuit of improving local air quality.

Details of all measures completed, in progress or planned are set out in Table 2.1. Eight measures are included within Table 2.1, with the type of measure and the progress Chorley Council have made during the reporting year of 2021 presented. Where there

have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1. More detail on these measures can be found in their respective Action Plans: Clean Air Strategy and Climate Change Strategy.

Chorley Council's priorities for the coming year are:

- To continue the enhanced monitoring programme and evaluate new monitoring locations.
- Enhance the monitoring capability of the Council for both nitrogen dioxide and particulate matter.
- To relaunch the Clean Air Strategy in conjunction with a new Climate Change Strategy.
- Engage with residents and businesses on Air Quality issues and new legislation.
- To require Air Quality Assessments to be undertaken on all relevant planning applications.
- To complete and implement the 'Lancashire wide Air Quality Guidance Document, if required independently of the full Lancashire working group.
- Require mitigation measures where appropriate on planning applications, including electric vehicle charging points to all suitable developments.
- Raise Air Quality within the new Central Lancashire Local Plan.

Chorley Council worked to implement these measures in partnership with the following stakeholders during 2021:

- Neighbouring local authorities
- The Highways Authority

The principal challenges and barriers to implementation that Chorley Council anticipates facing are lack of resources both internally and from partner organisations.

Progress on the following measures has been slower than expected due to: Staff resource reallocated to the Councils response to the Covid-19 pandemic.

**Table 2.1 – 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
1	Air Quality Planning Guidance	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020	2022	Lancashire LA's	Existing Budgets	NO	Not Funded	< £10k	Implementation	Reduced Emissions	Implementation	Implementation on-going	Limited buy in from DC. Potential to use Central Lancashire local plan to create SPG
2	Introduction of Air Quality and Climate Change Strategy	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2020	2022	Chorley Council	Existing Budgets	NO	Not Funded	< £10k	Implementation	Reduced Emissions	Adoption of air quality and climate change strategy	Implementation on-going	Focus of the Strategies will be to promote and support behavioural change and sustainable development
3	Electrification of the Rail Network	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	2016	2022	Network Rail	Network Rail	NO	Funded	£1 million - £10 million	Completed	Reduced diesel Emissions	100% electrification of line	Network rail completed the electrification of the line.	No additional incentive to use rail network
4	Make Air Quality and Climate Change key factors in Central Lancashire Planning Policy	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2020	2022	Preston City Council, South Ribble Borough Council and Chorley Council	Existing Budgets	NO	Partially Funded	£50k - £100k	Planning	Reduced Emissions	Inclusion within the Central Lancs Plan	Central Lancs Local Plan progressing across the 3 LA's with preliminary meetings now held. Work being taken forward.	Developers' reluctance to implement planning policy guidance.
5	Develop an engagement strategy to support the AQ agenda across the borough	Public Information	Via other mechanisms	2022	2023	Chorley Council	Existing Budgets	NO	Not Funded	< £10k	Implementation	Reduced Emissions	Implementation	Produced calendar of AQ activities, e.g. ASR publication, "Clean Air Day" and "Ready to Burn" campaigns for council social media channels.	Resistance from residents and businesses. New legislation and Guidance from Central Government needed.
6	Promote flexible and homeworking to reduce commuting and avoidable travel	Promoting Travel Alternatives	Encourage / Facilitate homeworking	2021	2022	Chorley Council	Existing Budgets	NO	Not Funded	< £10k	Completed	Reduced staff travel	Implementation	Adopted a hybrid-working charter, incorporated into business plan by service leads.	Public accessibility to Council services and staff. Availability of homeworking equipment.
7	Improved access to Electric vehicles Charging options	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	2023	Chorley Council	Existing Budgets + External Grants	NO	Not Funded	£10k - 50k	Implementation	Reduced Emissions	Reliable EV charging network across Borough	Review car park charging policy relating to EV's and consult with public to incentivise alternative travel.	Cost of EV vehicles. Availability of space for EV charging points.

## 2.3 PM<sub>2.5</sub> – 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<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Chorley Council has not previously monitored PM<sub>10</sub> or PM<sub>2.5</sub> levels. The Defra background maps indicate that over half of the PM<sub>2.5</sub> affecting Chorley results from Secondary Sources. These are formed in the atmosphere by chemical reactions involving primary emitted precursor species, such as sulphate, nitrate (formed by oxidation of gaseous NO<sub>2</sub>), ammonium and the oxidation of certain volatile organic compounds (VOCs). It is also noted that, *‘as much as 40% to 50% of the levels found in any given area can be from sources outside a local authority’s direct boundary.’*

This does not mean we are complacent to the primary emissions from combustion (industrial processes and road traffic exhausts) and non-combustion processes (e.g. fugitive emissions from agricultural and industrial material handling; non-exhaust emissions from vehicles - tyre and brake wear, and road abrasion).

Chorley Council is taking the following measures to address PM<sub>2.5</sub>:

- The trial roll-out of monitoring using EarthSense Zephyr continuous automatic particulate monitors at three locations across the borough. Though this system is not approved for inclusion in the ASR or certified using the Environment Agency’s Indicative instrument certification scheme, the data collected will provide qualitative data on the scale of the issue, particulate pollution trends and a benchmark against which to measure progress. They will also be used to produce short, local campaigns around air quality.
- Encouraging the use of alternative travel options e.g., cycling, walking, and use of public transport.
- Working on the implementation a robust Air Quality Planning Guidance.

- Raise awareness of the harmful effects of PM<sub>2.5</sub> using the Public Health Indicator's which demonstrate that Chorley suffers from an adult mortality attributed to particulate matter of 4.2% (2019).
- Increasing public and business engagement work around particulate pollution including, but limited to, raising awareness of Chorley's Smoke Control Areas, and linking with the "Ready to Burn" campaign.
- Working with neighbouring local authorities (South Ribble Borough Council and Preston City Council) as part of the Central Lancashire Local Plan and other fora to address air quality regionally.

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

This section sets out the monitoring undertaken within 2021 by Chorley 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.

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

Chorley Council reviewed and expanded the NO<sub>2</sub> monitoring programme during 2021. It was identified that some monitoring locations across the Borough and were not necessarily located in areas of relevance and therefore relocated.

Furthermore, as a result of the review, the following monitoring locations were retired CH14, CH14A, CH29 & CH30, as the distance from receptors was too great to give a meaningful exposure estimate. 29 new monitoring locations were added to the sampling programme, located in areas of high traffic build-up, for which further information regarding air quality was required.

The monitoring locations will be kept under review to ensure the most comprehensive coverage and representative data collection. None of these changes have resulted in the declaration of an AQMA.

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

### 3.1.1 Automatic Monitoring Sites

Chorley Council does not currently have any automatic monitoring sites.

Chorley Council began a trial of qualitative automatic (continuous) monitoring for PM at three sites during 2021 (located at CH05, CH51 and CH59). The system under trial uses Zephyr continuous air quality monitors provided by EarthSense Systems Limited. The data collected from these monitors are not approved for inclusion in the ASR or certified using the Environment Agency's Indicative instrument certification scheme and therefore not able to be included in the ASR. However, the outcome of this trial will be published during the next reporting period once sufficient data has been collected.

### 3.1.2 Non-Automatic Monitoring Sites

Chorley Council undertook non-automatic (i.e. passive) monitoring of NO<sub>2</sub> at 43 sites during 2021. 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.

## 3.2 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.

### 3.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

Table A.1 and Table A.2 in Appendix A compare the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past five years with the air quality objective of 40µg/m<sup>3</sup>. 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 2021 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

There are no exceedances of the air quality objectives, either by the annual mean concentrations of 40µg/m<sup>3</sup> or any tube result exceeding 60µg/m<sup>3</sup>, which indicates that an exceedance of the 1-hour mean objective is unlikely.

Chorley Council significantly expanded the monitoring programme during 2021. Therefore, there are insufficient data for each new location over the preceding years to draw conclusions from. Tentative inferences from the 11 existing monitoring locations suggests that for nitrogen dioxide, following a downward trend at the roadside over the previous year's emissions are beginning to plateau or increase marginally. This is likely due to traffic levels starting to increase again during 2021 following the significant reductions in traffic flow seen during the Covid-19 pandemic. Sites will be continued to be monitored over the forthcoming reporting periods to allow sufficient data to be collected to enable trends to be seen.

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

Chorley Council does not currently monitor PM<sub>10</sub> or PM<sub>2.5</sub> levels. However, a check of the Defra background maps indicates no likely exceedances of the objective levels for either of these two pollutants.

Chorley Council started to monitor PM<sub>10</sub> or PM<sub>2.5</sub> levels during 2021 as part of the Zephyr continuous air quality monitor trial. The data collected from these monitors is indicative and therefore is not able to be included in the ASR. However, the outcome of this trial will be published during the next reporting period once sufficient data has been collected. This will give a qualitative overview for Chorley.

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

Chorley Council does not currently monitor PM<sub>10</sub> or PM<sub>2.5</sub> levels. However, a check of the Defra background maps indicates no likely exceedances of the objective levels for either of these two pollutants.

Chorley Council started to monitor PM<sub>10</sub> or PM<sub>2.5</sub> levels during 2021 as part of the Zephyr continuous air quality monitor trial. The data collected from these monitors is indicative and therefore is not able to be included in the ASR. However, the outcome of this trial will be published during the next reporting period once sufficient data has been collected. This will give a qualitative overview for Chorley.

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

Chorley Council does not monitor SO<sub>2</sub> 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)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
CH 35	St Thomas Road	Roadside	358145	417645	NO2	No	3.0	3.2	No	2.5
CH 23	Market St, Chorley	Roadside	358357	417297	NO2	No	1.5	2.5	No	2.5
CH 25	Bolton Street	Roadside	358518	417072	NO2	No	0.5	1.8	No	2.5
CH 36	Bolton Road	Roadside	358714	416839	NO2	No	0.4	2.0	No	2.5
CH 37	Bolton Road	Roadside	358830	416726	NO2	No	0.0	2.2	No	2.5
CH 38	Bolton Road	Roadside	359060	416468	NO2	No	0.0	2.9	No	2.5
CH 39	Duxbury Manor Gardens	Roadside	358933	415862	NO2	No	0.0	13.0	No	2.5
CH 05	Market St, Adlington	Kerbside	360095	413089	NO2	No	2.5	0.5	No	2.5
CH 40	Devonshire Road	Roadside	358092	416925	NO2	No	0.0	2.3	No	2.5
CH 41	Moor Road	Roadside	357387	416123	NO2	No	0.0	3.0	No	2.5

CH 06	Moor Road	Kerbside	357436	416130	NO2	No	8.5	0.5	No	2.5
CH 42	Spendmore Lane – Coppull	Roadside	356547	414525	NO2	No	0.0	5.5	No	2.5
CH 43	Spendmore lane – Coppull	Roadside	356339	414150	NO2	No	0.0	2.5	No	2.5
CH 44	Spendmore lane – Coppull	Roadside	356039	414054	NO2	No	0.0	1.5	No	2.5
CH 45	Preston Road Coppull	Roadside	355534	413755	NO2	No	3.5	5.0	No	2.5
CH 46	A49 Wigan Road South	Roadside	355540	418309	NO2	No	7.5	2.0	No	2.5
CH 08	Balshaw Lane	Roadside	355891	418467	NO2	No	11.0	2.0	No	2.5
CH 11	A49 Wigan Road South, Euxton Ln	Kerbside	355454	419317	NO2	No	1.5	0.5	No	2.5
CH 47	Buckshaw Avenue	Roadside	356464	420218	NO2	No	4.5	2.0	No	2.5
CH 48	Buckshaw Avenue	Roadside	356485	420262	NO2	No	0.0	3.0	No	2.5
CH 49	Buckshaw Avenue	Roadside	356613	420245	NO2	No	0.0	11.0	No	2.5
CH 50	M6, Moss Lane	Roadside	355400	422696	NO2	No	0.0	17.5	No	2.5
CH 51	A49 Wigan Road - Lancaster Lane	Roadside	355697	422432	NO2	No	3.8	2.0	No	2.5
CH 52	A6 Preston Road – near M65	Roadside	357335	424499	NO2	No	0.0	5.5	No	2.5
CH 53	A6 Preston Road	Roadside	357902	423586	NO2	No	5.0	1.0	No	2.5

CH 32	M61, Ashdown	Roadside	358313	422937	NO2	No	5.5	0.9	No	2.5
CH 31	A6 Preston Road Clayton	Roadside	357879	423303	NO2	No	1.2	2.9	No	2.5
CH 17	A6 Preston Rd, Whittle	Kerbside	357936	422176	NO2	No	0.5	4.0	No	2.5
CH 17a	A6 Preston Rd, Whittle	Roadside	357885	421524	NO2	No	7.0	1.5	No	2.5
CH 33	A6 Preston Road Whittle	Kerbside	358110	420361	NO2	No	2.4	1.4	No	2.5
CH 34	M61, Fallow Close	Kerbside	358568	420246	NO2	No	3.3	0.5	No	2.5
CH 54	A6 Preston Road	Roadside	358193	419909	NO2	No	0.0	8.4	No	2.5
CH 55	Blackburn Road	Roadside	359415	419740	NO2	No	8.5	11.5	No	2.5
CH 56	BOTANY BAY – Millennium way	Roadside	359110	419646	NO2	No	320.0	2.0	No	2.5
CH 57	BOTANY BAY – Entrance	Roadside	359019	419651	NO2	No	320.0	2.0	No	2.5
CH 19	A6, Chorley Hospital	Roadside	358335	419226	NO2	No	10.0	4.0	No	2.5
CH 24	Euxton Lane, Hospital	Roadside	358023	419151	NO2	No	1.0	1.5	No	2.5
CH 20	A6 South Chorley Hospital	Roadside	358325	418987	NO2	No	13.0	1.0	No	2.5
CH 58	A6 Preston Road	Roadside	358399	418579	NO2	No	30.0	1.0	No	2.5
CH 59	A6 Preston Road	Roadside	358448	418540	NO2	No	0.0	3.0	No	2.5

CH 60	Water Street	Kerbside	358541	417816	NO2	No	2.0	0.5	No	2.5
CH 61	Water Street	Roadside	358526	417847	NO2	No	1.0	1.0	No	2.5
CH 62	Water Street	Roadside	358566	418400	NO2	No	6.0	1.0	No	2.5
CH 30	Buckshaw Avenue to Ordnance way	Kerbside	356815	420271	NO2	No	11.8	2.0	No	2.5
CH 29	M6 Subway Moss Lane	Kerbside	355423	422673	NO2	No	28.5	1.0	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 NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2021 (%)	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )				
						2017	2018	2019	2020	2021
CH 35	358145	417645	Roadside	100	66.9					21.6
CH 23	358357	417297	Roadside	75.1	75.1	31.3	30.9	32.8	23.3	25.7
CH 25	358518	417072	Roadside	82.8	82.8	29.2	25.8	25.7	26.2	20.8
CH 36	358714	416839	Roadside	100	66.9					32.3
CH 37	358830	416726	Roadside	100	66.9					28.1
CH 38	359060	416468	Roadside	100	66.9					19.5
CH 39	358933	415862	Roadside	100	66.9					11.3
CH 05	360095	413089	Kerbside	82.8	82.8	33.8	34.1	32.2	23.4	24.8
CH 40	358092	416925	Roadside	100	66.9					13.8
CH 41	357387	416123	Roadside	87.5	57.4					23.5
CH 06	357436	416130	Kerbside	82.8	82.8	28.0	28.0	27.1	22.0	21.9
CH 42	356547	414525	Roadside	100	66.9					17.3
CH 43	356339	414150	Roadside	87.5	59.3					20.3
CH 44	356039	414054	Roadside	100	66.9					24.5
CH 45	355534	413755	Roadside	100	66.9					23.8
CH 46	355540	418309	Roadside	100	66.9					27.6
CH 08	355891	418467	Roadside	82.8	82.8	29.3	29.3	29.0	21.6	23.4
CH 11	355454	419317	Kerbside	82.8	82.8	28.2	26.6	24.2	19.5	21.5
CH 47	356464	420218	Roadside	100	66.9					17.8
CH 48	356485	420262	Roadside	100	66.9					17.8
CH 49	356613	420245	Roadside	100	66.9					18.5
CH 50	355400	422696	Roadside	100	66.9					21.9
CH 51	355697	422432	Roadside	100	66.9					27.1
CH 52	357335	424499	Roadside	100	66.9					17.7
CH 53	357902	423586	Roadside	100	66.9					29.7
CH 32	358313	422937	Roadside	82.8	82.8				17.2	18.7
CH 31	357879	423303	Roadside	82.8	82.8				16.9	18.7
CH 17	357936	422176	Kerbside	100	66.9					23.9
CH 17a	357885	421524	Roadside	82.8	82.8	28.3	28.0	27.0	20.3	20.5
CH 33	358110	420361	Kerbside	82.8	82.8				19.6	21.0

CH 34	358568	420246	Kerbside	82.8	82.8					18.6	20.1
CH 54	358193	419909	Roadside	100	66.9						18.4
CH 55	359415	419740	Roadside	100	66.9						15.8
CH 56	359110	419646	Roadside	87.5	57.4						23.8
CH 57	359019	419651	Roadside	100	66.9						15.7
CH 19	358335	419226	Roadside	82.8	82.8	34.1	31.1	30.4	21.1	22.2	
CH 24	358023	419151	Roadside	82.8	82.8	33.5	34.9	31.4	23.7	26.7	
CH 20	358325	418987	Roadside	82.8	82.8	32.2	31.7	30.2	22.7	24.4	
CH 58	358399	418579	Roadside	100	66.9						33.3
CH 59	358448	418540	Roadside	100	66.9						24.6
CH 60	358541	417816	Kerbside	100	66.9						37.6
CH 61	358526	417847	Roadside	100	66.9						32.1
CH 62	358566	418400	Roadside	100	66.9						30.2
CH 30	356815	420271	Kerbside	100	15.8					24.3	-
CH 29	355423	422673	Kerbside	100	15.8					19.0	-
CH 14A	355663	422349	Roadside	100	15.8	<b>42.3</b>	38.9	37.1	29.5	-	-
CH 14	355674	422568	Roadside	100	15.8	29.8	27.0	26.3	20.7	-	-

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

Diffusion tube data has been bias adjusted.

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  $\mu\text{g}/\text{m}^3$ .

Exceedances of the NO<sub>2</sub> annual mean objective of  $40\mu\text{g}/\text{m}^3$  are shown in **bold**.

NO<sub>2</sub> annual means exceeding  $60\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the NO<sub>2</sub> 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.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.

(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%).

Figure A.1 – Trends in Annual Mean NO<sub>2</sub> Concentrations Across Chorley North Sampling Sites

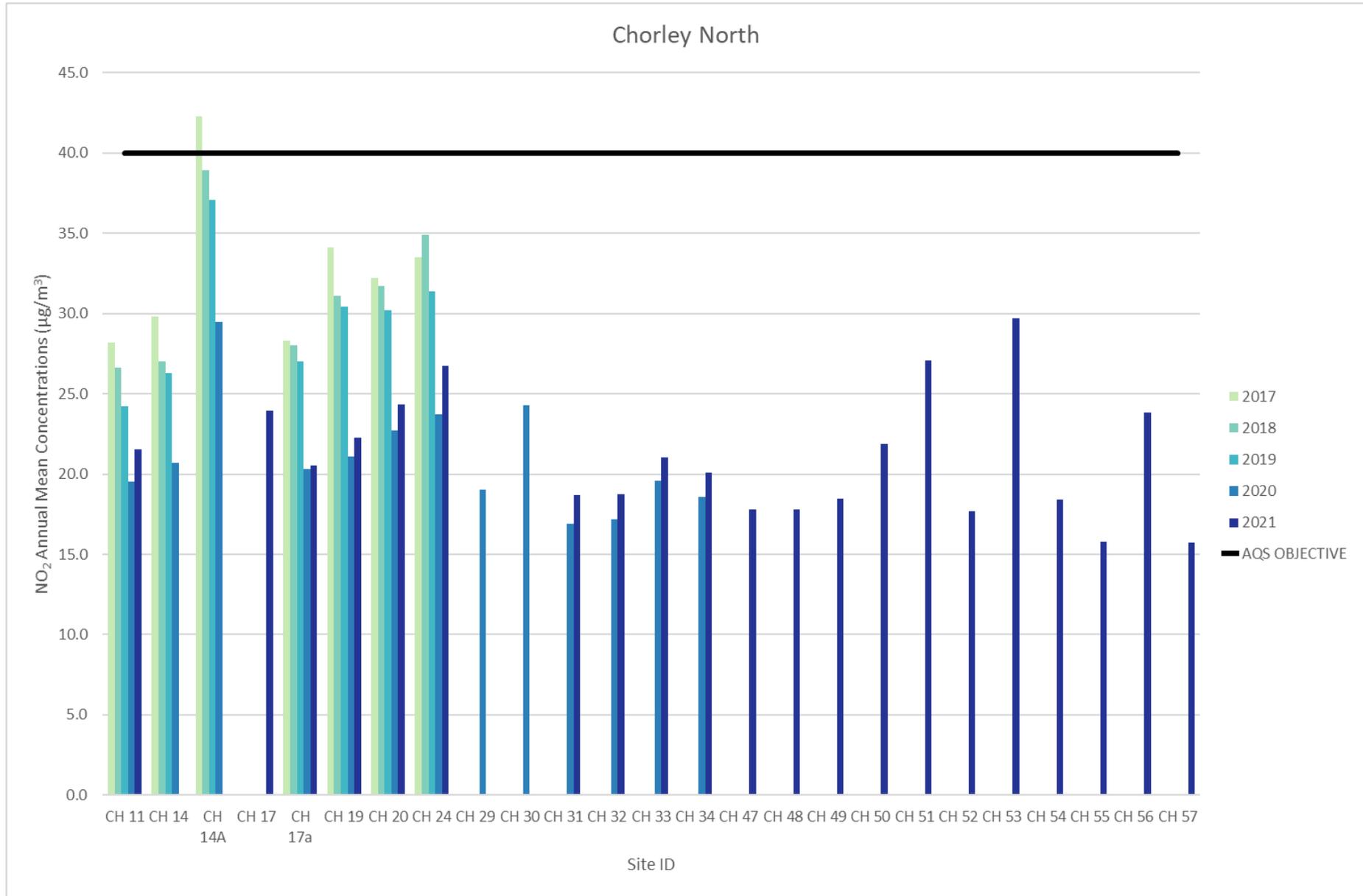
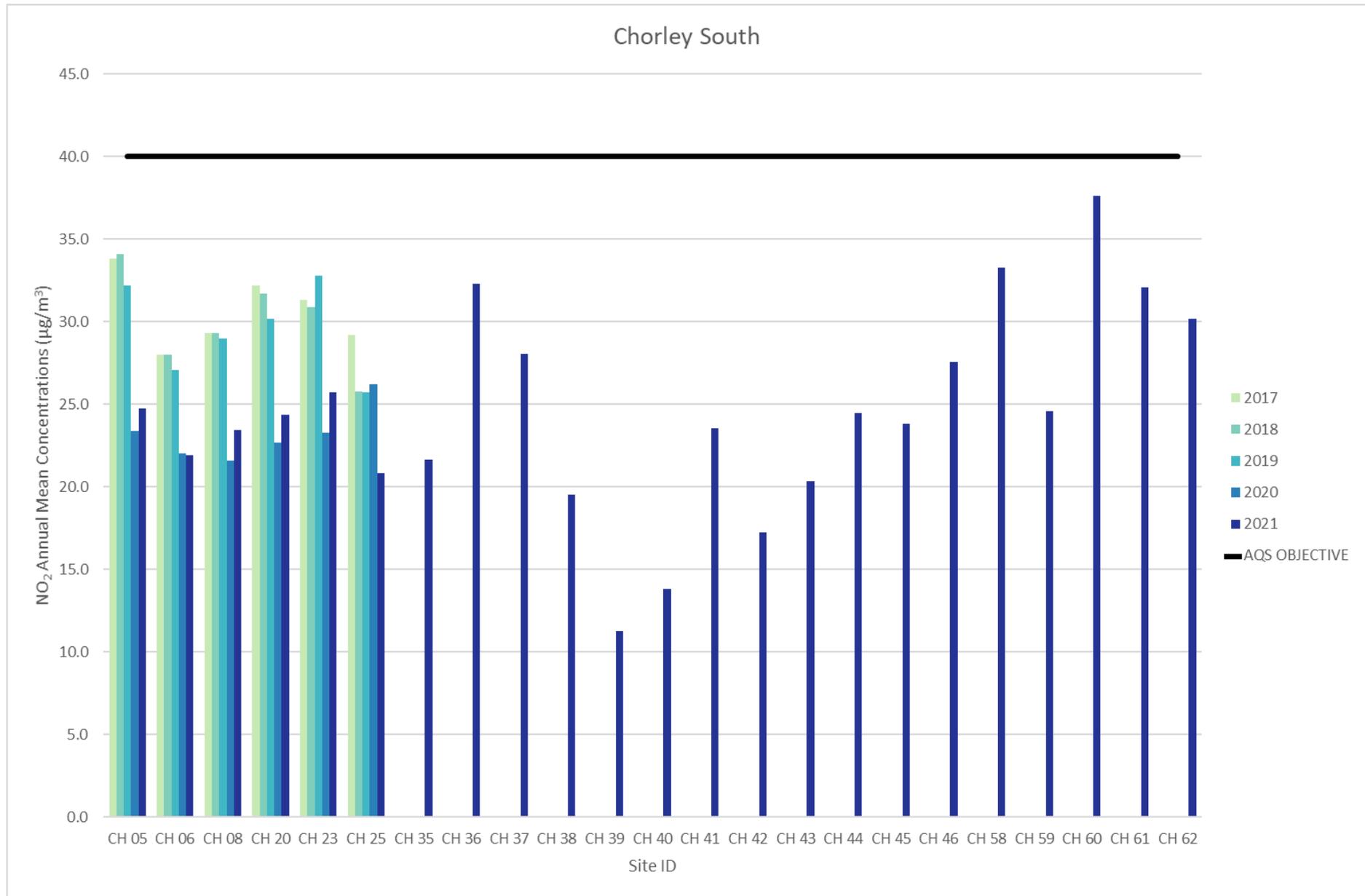


Figure A.2 – Trends in Annual Mean NO<sub>2</sub> Concentrations Across Chorley South Sampling Sites



## Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO<sub>2</sub> 2021 Diffusion Tube Results (µg/m<sup>3</sup>)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )												Simple Annual Mean (µg/m <sup>3</sup> )			Comment
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.84) and Annualised	Distance Corrected to Nearest Exposure	
CH 35	358145	417645					23.7	18.8	19.7	17.0	28.3	24.3	32.1	30.7	24.3	21.6	-	
CH 23	358357	417297	33.1	33.1			26.6		22.5	22.4	33.0	31.4	36.6	36.7	30.6	25.7	-	
CH 25	358518	417072	28.2	28.2			22.9	19.4	19.5	17.4	27.4	25.1	32.7	26.9	24.8	20.8	-	
CH 36	358714	416839					39.0	32.8	38.1	24.0	39.8	40.6	42.2	34.1	36.3	32.3	-	
CH 37	358830	416726					33.4	27.8	31.1	21.2	32.8	32.2	40.8	33.0	31.6	28.1	-	
CH 38	359060	416468					22.6	18.2	18.2	16.8	23.3	23.2	28.0	25.5	22.0	19.5	-	
CH 39	358933	415862					10.9	8.9	9.4	8.9	13.3	13.6	18.4	17.8	12.7	11.3	-	
CH 05	360095	413089	32.5	32.5			28.2	23.6	25.7	22.5	30.8	31.5	37.8	29.8	29.5	24.8	-	
CH 40	358092	416925					13.6	11.3	11.1	11.8	16.9	16.3	23.1	20.2	15.5	13.8	-	
CH 41	357387	416123					21.9	21.5	21.6	19.2	26.6	23.0	30.2		23.4	23.5	-	
CH 06	357436	416130	29.9	29.9			23.4	21.5	23.4	18.9	27.1	24.7	34.6	27.3	26.1	21.9	-	
CH 42	356547	414525					18.3	17.0	16.6	15.5	20.6	17.4	26.0	23.9	19.4	17.3	-	
CH 43	356339	414150					23.4	20.4	18.1	17.8		25.8	29.7	26.2	23.1	20.3	-	
CH 44	356039	414054					26.0	26.7	26.6	21.0	31.1	25.2	35.2	28.3	27.5	24.5	-	
CH 45	355534	413755					27.4	25.0	27.0	20.1	27.9	27.6	33.4	25.8	26.8	23.8	-	
CH 46	355540	418309					26.6	30.2	32.5	26.5	34.4	29.1	37.3	31.0	31.0	27.6	-	
CH 08	355891	418467	31.2	31.2			25.5	22.1	22.7	21.7	30.5	27.6	34.8	31.7	27.9	23.4	-	
CH 11	355454	419317	29.8	29.8			23.9	19.4	20.2	19.3	25.8	25.0	31.3	31.7	25.6	21.5	-	
CH 47	356464	420218					18.2	17.1	14.1	13.8	21.0	21.9	28.6	25.5	20.0	17.8	-	
CH 48	356485	420262					19.0	16.3	16.6	14.3	20.6	20.2	26.4	26.6	20.0	17.8	-	
CH 49	356613	420245					20.3	16.2	18.0	15.1	21.5	21.3	28.2	25.7	20.8	18.5	-	
CH 50	355400	422696					23.7	20.6	24.2	18.6	21.5	27.2	34.0	26.7	24.6	21.9	-	
CH 51	355697	422432					29.8	27.3	33.6	21.5	34.7	30.1	36.2	30.4	30.4	27.1	-	
CH 52	357335	424499					19.0	18.8	21.2	15.6	21.2	20.9	23.6	18.8	19.9	17.7	-	
CH 53	357902	423586					30.8	30.4	34.2	23.2	37.6	34.4	44.5	31.8	33.4	29.7	-	
CH 32	358313	422937	24.6	24.6			20.8	20.3	19.9	18.9	25.9	18.8	25.7	23.8	22.3	18.7	-	
CH 31	357879	423303	24.1	24.1			20.4	17.6	18.1	16.6	22.4	23.0	29.0	27.5	22.3	18.7	-	
CH 17	357936	422176					23.9	21.9	24.3	18.0	29.2	28.0	38.7	31.0	26.9	23.9	-	
CH 17a	357885	421524	27.3	27.3			23.7	21.3	20.2	17.1	24.2	24.3	30.3	28.7	24.4	20.5	-	
CH 33	358110	420361	27.2	27.2			23.9	21.1	21.1	16.3	26.0	25.5	32.1	30.2	25.1	21.0	-	
CH 34	358568	420246	30.9	30.9			22.0	17.9	18.6	19.0	28.0	18.1	26.8	26.9	23.9	20.1	-	
CH 54	358193	419909					18.2	19.0	18.6	16.3	23.2	20.6	25.6	23.9	20.7	18.4	-	
CH 55	359415	419740					16.2	14.5	15.3	14.5	17.1	18.2	22.8	23.1	17.7	15.8	-	
CH 56	359110	419646					18.7	21.4	24.8	20.1	24.2	25.4	31.4		23.7	23.8	-	
CH 57	359019	419651					13.2	12.5	13.4	13.1	15.4	19.0	29.3	25.2	17.6	15.7	-	
CH 19	358335	419226	26.4	26.4			23.2	26.2	23.9	19.0	26.7	26.7	34.6	31.8	26.5	22.2	-	
CH 24	358023	419151	34.0	34.0			29.2	28.2	27.3	23.6	36.0	35.4	37.3	33.3	31.8	26.7	-	
CH 20	358325	418987	29.3	29.3			27.4	24.4	27.8	20.0	28.6	29.6	41.2	32.4	29.0	24.4	-	
CH 58	358399	418579					34.0	29.1	31.9	24.2	40.5	39.9	54.2	45.5	37.4	33.3	-	
CH 59	358448	418540					26.9	27.4	28.9	20.2	29.4	29.2	35.4	23.6	27.6	24.6	-	
CH 60	358541	417816					39.6	35.6	43.5	30.6	46.8	41.8	55.1	45.0	42.3	37.6	31.9	
CH 61	358526	417847					36.5	29.4	30.8	26.6	42.4	35.0	44.6	43.1	36.1	32.1	-	
CH 62	358566	418400					31.7	26.7	29.8	22.2	34.4	47.9	41.8	37.0	33.9	30.2	-	
CH 30	356815	420271	29.4	29.4											-	-	-	
CH 29	355423	422673	24.2	24.2											-	-	-	



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

### **New or Changed Sources Identified Within Chorley Council During 2021**

Where there is a potential for an impact upon air quality, comments are requested from Environmental Health consultees. If appropriate recommendations on further sustainability measures could apply to an application, Environmental Health consultees made these, for example, to include EV charging points in developments or the use of renewable heating systems.

As with most areas there are pockets of residential development that have been granted planning permission. Air quality reports have been prepared for the majority of these developments with most indicating a negligible impact. Most of the sites that have been granted permission have begun (and in some cases completed) construction work during 2021.

There have been no major road improvements or new roads or significant changes in traffic flow over the last year, with no significant changes to the railway network throughout the borough. 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 upon air quality.

Chorley Council has not identified any new sources relating to air quality within the reporting year of 2021.

### **Additional Air Quality Works Undertaken by Chorley Council During 2021**

Chorley Council has not completed any additional works within the reporting year of 2021.

## QA/QC of Diffusion Tube Monitoring

The diffusion tubes used by Chorley Council were supplied by Gradko Environmental Ltd, using a 20% TEA / Water solution. The Air Quality Review and Assessment website gives a bias adjustment figure of 0.84 for the 2021 data set.

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

The diffusion tube monitoring program has been completed generally in line with the 2021 Diffusion Tube Monitoring Calendar, during a couple of months the diffusion tubes were changed slightly later than the planned day for example during the summer months. These dates have been noted and the correct exposure times recorded. All tubes were exposed for the minimum of 4 weeks with no tubes exposed for longer than 4.5 weeks, except for the January 2021 tubes which were left out for a period of 2 months due to the Covid 19 Pandemic. No tubes were put out or collected during March and April 2021, due to the NO<sub>2</sub> monitoring programme undergoing a significant reorganisation.

The results of the AIR NO<sub>2</sub> Proficiency Testing (PT) Scheme and a field inter-comparison exercise precision survey indicated a good overall level of precision with collocated studies for the Gradko diffusion tubes.

The AIR PT scheme uses laboratory spiked Palmes type diffusion tubes to test each participating laboratory's analytical performance on a quarterly basis and continues the format used in the preceding WASP PT scheme. The results are published and are detailed below.

Gradko International have provided a 25% satisfactory response to tested samples up to March 2021 (the latest data available). Previously a 75% satisfactory response to tested samples up to October 2020. However, it should be noted that due to the Covid-19 pandemic most of the test sampling over the year has not been undertaken.

Table C.1 lists those UK laboratories undertaking LAQM activities that have participated in recent AIR NO<sub>2</sub> PT rounds and the percentage (%) of results submitted which were subsequently determined to be satisfactory.

Diffusion tube precision can be described as the ability of a measurement to be consistently reproduced, i.e., how similar the results of duplicate or triplicate tubes are to each other. For the purposes of Local Air Quality Management, tube precision is separated into two categories, “good” or “poor”. Gradko International presented a good level of precision over the past three years. A summary of the results of collocated diffusion tube analysis by various laboratories is presented in [Table C.1](#).

**Table C.1 - Laboratory summary performance for AIR Nitrogen Dioxide PT rounds, 2019-2021**

AIR PT Round	AR030	AR031	AR033	AR034	AR036	AR037	AR039	AR040	AR042
Round conducted in the period	January – February 2019	April – May 2019	July – August 2019	September – November 2019	January – February 2020	May – June 2020	July – August 2020	September – October 2020	January – March 2021
Aberdeen Scientific Services	75%	100%	100%	100%	100%	NR [3]	NR [3]	100%	100%
Edinburgh Scientific Services	100%	NR [2]	100%	25%	50%	NR [3]	NR [3]	100%	25%
SOCOTEC	87.5 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	NR [3]	NR [3]	100 % [1]	100 % [1]
Glasgow Scientific Services	100%	100%	100%	50%	100%	NR [3]	NR [3]	100%	50%
<b>Gradko International</b>	<b>75%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>75%</b>	<b>NR [3]</b>	<b>NR [3]</b>	<b>75%</b>	<b>25%</b>
Lambeth Scientific Services	50%	100%	50%	100%	100%	NR [3]	NR [3]	100%	100%
Milton Keynes Council	100%	100%	50%	100%	100%	NR [3]	NR [3]	25%	0%
Somerset Scientific Services	100%	100%	100%	100%	100%	NR [3]	NR [3]	100%	100%
South Yorkshire Air Quality Samplers	100%	100%	100%	75%	100%	NR [3]	NR [3]	100%	100%
Staffordshire County Council	100%	75%	75%	75%	100%	NR [3]	NR [3]	50%	100%
Tayside Scientific Services (formerly Dundee CC)	100%	NR [2]	100%	NR [2]	100%	NR [3]	NR [3]	100%	NR [2]
West Yorkshire Analytical Services	100%	100%	100%	50%	100%	NR [3]	NR [3]	NR [2]	NR [2]

[1] Participant subscribed to two sets of test results (2 x 4 test samples) in each AIR PT round.

[2] NR, No results reported.

[3] Round was cancelled due to pandemic

**Table C.2 - Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation Studies by Laboratory, 2019-2021**

Diffusion Tube Preparation Method	2019 Good	2019 Bad	2020 Good	2020 Bad	2021 Good	2021 Bad
Gradko, 50% TEA in Acetone	27	0	19	1	14	0
<b>Gradko, 20% TEA in Water</b>	<b>30</b>	<b>1</b>	<b>27</b>	<b>0</b>	<b>32</b>	<b>0</b>
ESG Didcot / SOCOTEC, 50% TEA in Acetone	40	1	24	0	20	3
ESG Didcot / SOCOTEC, 20% TEA in Water	12	0	6	0	4	1
Staffordshire Scientific Services	17	0	15	0	13	1
Glasgow Scientific Services	9	2	2	7	1	5
Edinburgh Scientific Services	4	2	4	1	1	0
Milton Keynes Council	2	0	4	0	1	0
Tayside Scientific Services	1	0	1	0	1	0
Lambeth Scientific Services	8	1	8	2	4	1
West Yorkshire Analytical Services	1	1	0	0	0	0
Aberdeen Scientific Services	6	0	7	0	7	0
South Yorkshire Air Quality Samplers	3	0	1	0	1	0
ESG Glasgow, 50% TEA in Acetone	1	0	1	0	0	1
ESG Glasgow, 20% TEA in Water	1	0	1	0	0	1
Somerset County Council	9	0	10	0	2	0

## Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%.

Annualisation was required for 29 locations which had a 66% capture rate, due to their introduction part way through the monitoring period. The sites requiring annualisation were: CH 35, CH 36, CH 37, CH 38, CH 39, CH 40, CH 41, CH 42, CH 43, CH 44, CH 45, CH 46, CH 47, CH 48, CH 49, CH 50, CH 51, CH 52, CH 53, CH 17, CH 54, CH 55, CH 56, CH 57, CH 58, CH 59, CH 60, CH 61 and CH 62.

The Automatic Urban and Rural Network sites at Wigan (UKA00482, Easting/Northing: 357816, 406024) and Preston (UKA00408, Easting/Northing: 355250, 430131) have been used to provide an annualisation correction factor of 1.0593 which was applied to the sites. Details of the calculation method undertaken are provided in Table C.4.

Fourteen diffusion tube monitoring locations within Chorley Council recorded data capture of greater than 75% and so it was not required to annualise these monitoring data.

In addition, four locations were retired part-way through the monitoring period (CH14, CH14A, CH29 & CH30), therefore had an annual capture rate of less than 25%. They do not require annualisation and have been excluded from the calculations.

## 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<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Chorley Council have applied a national bias adjustment factor of 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used by Chorley Council over the past five years is presented in [Table C.3](#).

**Table C.3 – Bias Adjustment Factor**

<b>Year</b>	<b>Local or National</b>	<b>If National, Version of National Spreadsheet</b>	<b>Adjustment Factor</b>
<b>2021</b>	National	04/22	0.84
<b>2020</b>	National	06/21	0.81
<b>2019</b>	National	03/20	0.93
<b>2018</b>	National	03/19	0.93
<b>2017</b>	National	03/18	0.89

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

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO<sub>2</sub> concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO<sub>2</sub> concentrations corrected for distance are presented in Table B.1.

A fall-off-with-distance calculation was required for one non-automatic monitoring site, the output from the Diffusion Tube Data Processing Tool is presented in Table C.5.

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36 µg/m<sup>3</sup>. During the 2021 monitoring period site CH 60 was the only site to exceed this, recording a bias adjusted and annualised NO<sub>2</sub> annual mean concentration value of 37.6 µg/m<sup>3</sup>.

At this location only one road source is present. The background concentration value is taken from the national maps published at <https://uk-air.defra.gov.uk/data/laqm-background-home>, or alternatively from a nearby monitor in a background location. It is noted that predicted concentration results will have a greater uncertainty than measured data. In this instance, the distance between the monitor and the receptor is small, therefore the result is considered to be an acceptable estimation.

Table C.4 – Annualisation Summary (concentrations presented in  $\mu\text{g}/\text{m}^3$ )

Diffusion Tube ID	Annualisation Factor Wigan (UKA00482) Urban B/g	Annualisation Factor Preston (UKA00408) Urban B/g	Annualisation Factor Site 3 Name	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Simple Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Annualised Data Simple Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Comments
CH 35	1.0761	1.0426			1.0593	24.3	25.8	
CH 36	1.0761	1.0426			1.0593	36.3	38.5	
CH 37	1.0761	1.0426			1.0593	31.6	33.4	
CH 38	1.0761	1.0426			1.0593	22.0	23.3	
CH 39	1.0761	1.0426			1.0593	12.7	13.4	
CH 40	1.0761	1.0426			1.0593	15.5	16.5	
CH 41	1.2830	1.1083			1.1957	23.4	28.0	
CH 42	1.0761	1.0426			1.0593	19.4	20.5	
CH 43	1.0676	1.0331			1.0503	23.1	24.2	
CH 44	1.0761	1.0426			1.0593	27.5	29.1	
CH 45	1.0761	1.0426			1.0593	26.8	28.4	
CH 46	1.0761	1.0426			1.0593	31.0	32.8	
CH 47	1.0761	1.0426			1.0593	20.0	21.2	
CH 48	1.0761	1.0426			1.0593	20.0	21.2	
CH 49	1.0761	1.0426			1.0593	20.8	22.0	
CH 50	1.0761	1.0426			1.0593	24.6	26.0	
CH 51	1.0761	1.0426			1.0593	30.4	32.3	
CH 52	1.0761	1.0426			1.0593	19.9	21.1	
CH 53	1.0761	1.0426			1.0593	33.4	35.3	
CH 17	1.0761	1.0426			1.0593	26.9	28.5	
CH 54	1.0761	1.0426			1.0593	20.7	21.9	
CH 55	1.0761	1.0426			1.0593	17.7	18.8	
CH 56	1.2830	1.1083			1.1957	23.7	28.4	
CH 57	1.0761	1.0426			1.0593	17.6	18.7	
CH 58	1.0761	1.0426			1.0593	37.4	39.6	
CH 59	1.0761	1.0426			1.0593	27.6	29.3	
CH 60	1.0761	1.0426			1.0593	42.3	44.8	
CH 61	1.0761	1.0426			1.0593	36.1	38.2	
CH 62	1.0761	1.0426			1.0593	33.9	35.9	

**Table C.5 – NO<sub>2</sub> Fall off With Distance Calculations (concentrations presented in µg/m<sup>3</sup>)**

Diffusion Tube ID	Distance (m)		NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> )			Comment
	Monitoring Site to Kerb	Receptor to Kerb	Bias Adjusted and Annualised	Background	Predicted at Receptor	
CH 60	0.5	2.5	37.6	17.5	31.9	

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

Figure D.1 – Map of Non-Automatic Monitoring Sites Chorley North

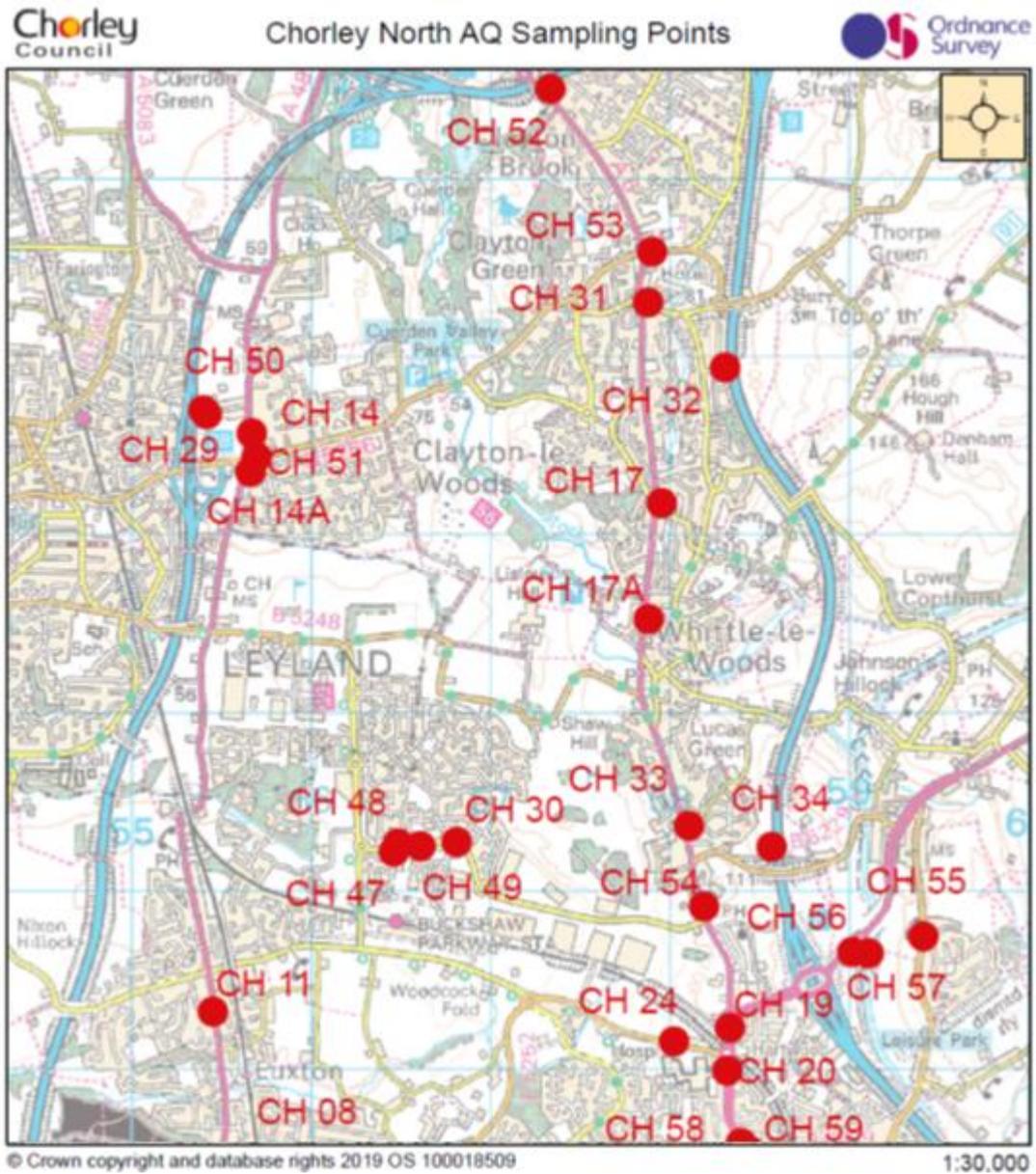
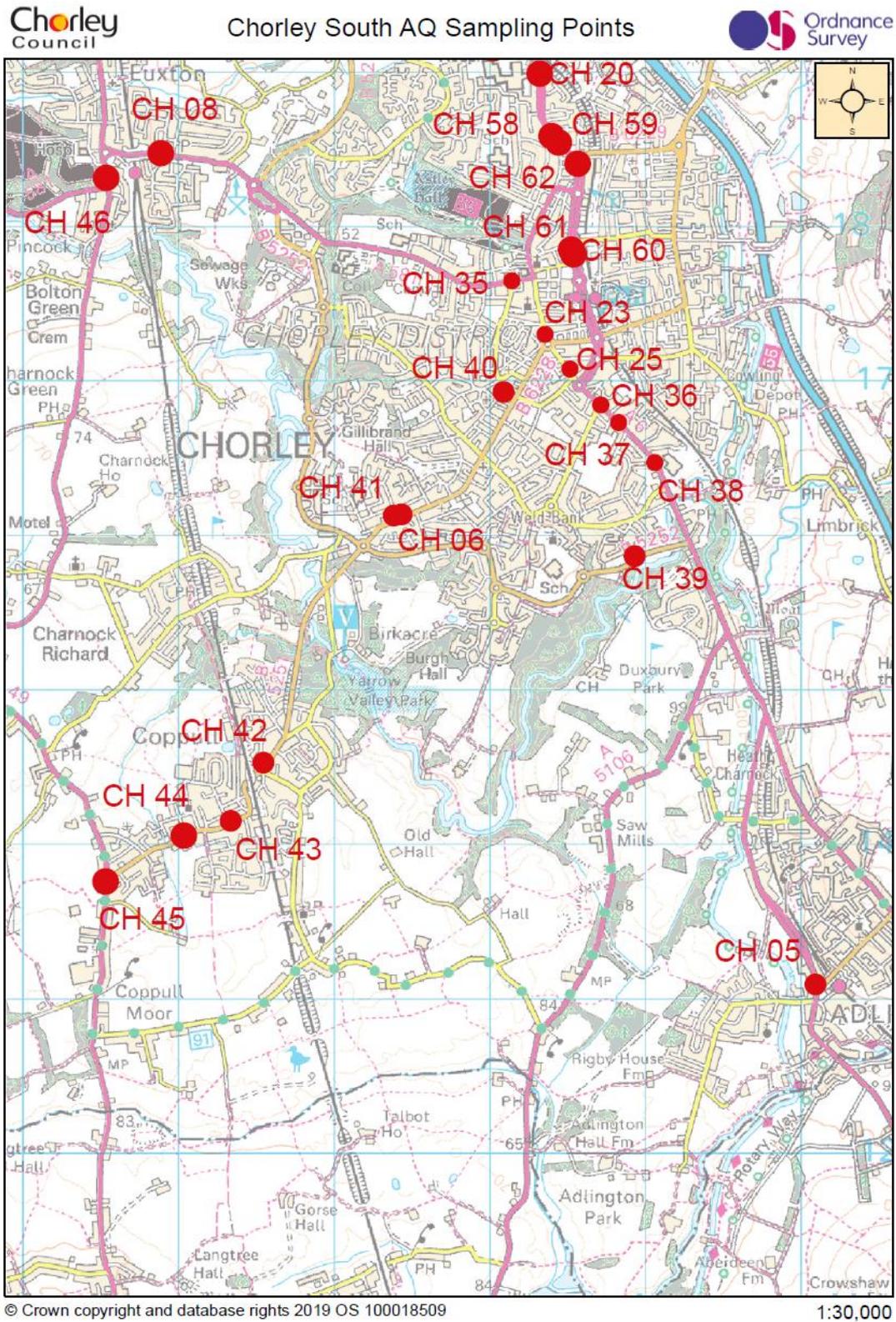


Figure D.2 – Map of Non-Automatic Monitoring Sites Chorley South



## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England<sup>7</sup>

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

<sup>7</sup> The units are in micrograms of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## 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 <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide

## References

- 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.