2020 and 2021 Air Quality Annual Status Reports (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: February 2022

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Executive Summary: Air Quality in Our Area

Air Quality in South Lakeland District

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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

It is for this reason South Lakeland District Council are charged with the review and assessment of air quality at a local level.

We have monitored nitrogen dioxide (NO_2) levels around the District since 1995. Previous assessments have shown that this is the only pollutant of concern in the district and that the principal source is road traffic.

An Air Quality Management Area (AQMA) was declared in 2001 when levels were found to be above the government's annual mean NO_2 objective on Lowther Street in Kendal. This was then extended in 2010 to cover other roads in the town centre, as shown on Defra's UK Air website. All other areas of the district meet the annual mean objective and all areas, including Lowther Street and the AQMA meet the short-term 1-hour mean.

After the initial AQMA declaration we drew up an Air Quality Action Plan (AQAP). This was done in partnership with other parties who can influence air quality (such as Cumbria County Council, Planners and the Town Council) through the Kendal Traffic Pollution Working Group, to ensure measures were in place to bring levels of NO_2 down to below the objective. This Action Plan is reviewed regularly by the Working Group to ensure it is still effective and

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

in 2016 we undertook a full review (see our Air Quality Action Plan 2016). It is updated annually to show progress and a summary can be found in section 2.2.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[4], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[5].

The good news is that over the years we have been monitoring and working to reduce areas which are above the annual mean/exceedance level, levels of NO_2 have shown a downward trend. Of the 22 sites where we monitor, only one location, on Lowther Street in Kendal (which is within the AQMA), remains above the objective. Even here levels have fallen dramatically over the years. The site had been predicted to fall below the objective in 2021, which it has done, however this data must be dealt with caution as the Covid pandemic significantly affected traffic movements around the District during the measurement period. We will continue to monitor the trends, but see no reason why this downward trend should not continue.

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[6] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[7] 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

[4] Defra. Air quality appraisal: damage cost guidance, July 2020

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

[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

Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

In 2019 and 2020 work continued within South Lakeland District to improve air quality and we, along with our partners have been continuing to work through the air quality action plan. Highlights during the period included:

- A successful bid was made and we have received 167k from an Innovate UK Funded Project to install electric charging points at 'on street locations' across the District.
- SLDC declared a climate emergency, leading to the development of a Climate change action plan. This is an action plan incorporating measures that will affect air quality within the District and importantly the Air Quality Management Area.
- The completion of schemes by Cumbria County Council (CCC) to improve traffic flow, highways, road widening and junction improvements.
- The continuation of a scheme to issue reduced priced parking permits for cleaner vehicles.
- Publication of a waking trails leaflet produced by Kendal Town Council to encourage walking around the town.
- Kendal Town Centre Strategy has been produced which now incorporates the actions in the Kendal Masterplan. This consolodated plan will continue to strategically look at ways to improve traffic flow, walking and cycling routes and car parking within the Town centre and the AQMA.

Conclusions and Priorities

The report shows that all locations within the district comply with the 1-hour NO_2 objective and that all sites except 1 (Burgundy's on Lowther Street) comply with the annual mean objective.

Levels at Burgundy's have fallen since the declaration of the AQMA and with continued work, predictions using DEFRA's future year calculator suggest that the site will be under the 40µg/m^3 limit by 2020.

No sites are within 10% of the annual objective.

Following the declaration of a climate emergency, a climate change strategy is now in place and will continue to improve air quality in South Lakes. It will ensure a strategic approach to climate change and will continue to be a priority for consideration at all levels of the organisation.

Priorities for the year ahead are:

- The authorisation of Officers to enforce anti idling Legislation.
- Review the size of the AQMA in line with DEFRA guidance and potentially reduce it to reflect the levels shown by the monitoring programme.
- Progress the delivery of the 'Charge My Street' scheme.

SLDC will continue to respond to local queries regarding air quality and monitoring locations will be continually reviewed in order to accurately reflect the concerns of residents and stakeholders. We strive for continuous improvement in air quality and maintain a local objective of an annual average NO_2 of 30µg/m^3.

We will continue to work closely with partners, including Cumbria County Council and Kendal Town Council in order to ensure best use of resources and ultimately progress with the action plan.

If you would like more information on air quality please visit the air quality pages on the Council's website: www.southlakeland.gov.uk .

Local Engagement and How to get Involved

We engage with parties who have an interest in, and are able to influence, air quality through the Kendal Traffic Pollution Working Group. Any consultations on air quality will be published on the council's website and public engagement is actively advertised and encouraged.

There are lots of simple things you can do to improve air quality including:

- Walk or cycle short journeys instead of using the car
- Use public transport

- Car share to work, school or activities
- Switch off your engine when stationary
- Choose a low emission vehicle such as an electric or hybrid. The network of charging points is continually growing across the district and across the country and these vehicles are becoming more popular and affordable
- Form a ‘walking bus’ for the journey to school

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1 Local Air Quality Management

This report provides an overview of air quality in South Lakeland during 2019 and 2020. Due to problems with reporting in 2020, DEFRA agreed that we could provide a consolidated report covering both years. 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 South Lakeland to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1.

2 Actions to Improve Air Quality

Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by South Lakeland District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=243. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)			Action Plan		
						At Declaration	2019	2020	Name	Date of Publication	Link
Kendal AQMA	Declared 05.05.2001, amended 23.11.10	NO2 Annual Mean	Kendal	An area encompassing properties bordering Lowther Street in Kendal, later extended to also cover properties bordering Kirkland, Highgate, New Road, Blackhall Road, Stramondgate, Kent Street, Beezon Road, Wildman Street and Longpool in Kendal.	NO	82.1 µg/m3*	40.2µg/m3	22.5µg/m3 (treated with caution due to COVID-19 pandemic)	South Lakeland District Council Air Quality Action Plan	Nov-16	https://www.southlakeland.gov.uk/media/3644/sldc-air-quality-action-plan-2016.pdf

☒ **SLDC confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **SLDC confirm that all current AQAPs have been submitted to Defra.**

Progress and Impact of Measures to address Air Quality in South Lakeland

Defra's appraisal of South Lakeland's previous ASR noted that the conclusions reached were acceptable for all sources of pollutants and recommended that we continue to implement our air quality strategy and continue monitoring with the provisos below:

The report is well structured, detailed, and provides the information specified in the Guidance, following the latest template. The following comments are made:

1. It is encouraging to see that the Council have reviewed their monitoring programme and have introduced new monitoring locations. The Council should continue to review the monitoring programme on a regular basis, to ensure that monitoring takes place at any sites of potential exceedance with relevant exposure.
   SLDC response: Noted

2. The Council have provided distance corrected values however have not provided the calculations for these. It would be beneficial in future reports for the Council to use and present the distance correction calculator provided by Defra. https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html
   SLDC response: Noted

3. The Council's presentation of trend graphs is very useful as they clearly identify trends in and out of the AQMA. Furthermore, the Council also provide a good discussion of NO_2 trends within the district.
   SLDC response: Noted

4. Figures A.1 and A.2 present NO_2 data as far back as 2000, this is not necessary. The Council need only present data from the last 5 years. At present, the graphs appear overcrowded (particularly Figure A.20), this makes identifying the different years difficult for the reader. Should the Council wish to include data from 2000, it would be more beneficial to include another graph displaying this information alongside a 5-year trend graph.
   SLDC response: Noted

5. The Council have proposed an amendment of the current AQMA boundary. It is recommended that the Council refer to Section 3.48 'Amendment and revocation of AQMAs' in the LAQM TG16 guidance document to assess whether a detailed study or screening assessment is required to support the amendment of the AQMA boundary.
   SLDC response: Noted

South Lakeland District Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in the South Lakeland Air Quality Action Plan. Key completed measures are:

- A successful bid was made and the District was awarded 167k from an Innovate UK Funded Project 'Charge My Street' to install electric charging points at 'on street locations' across the District. Work will be undertaken in 2022 on the delivery of this project.
- SLDC declared a climate emergency, leading to the development of a Climate change action plan. This is a 50 point action plan incorporating measures that will affect air quality within the District and importantly within the Air Quality Management Area.
- A Clean Air Day event encouraging anti idling across the district.
- Kendal Master Plan has undergone consultation and is now the Town Centre Strategy, incorporating schemes that will improve air quality within the AQMA.
- The completion of schemes by CCC to improve traffic flow, highways, road widening and junction improvements.
- The continuation of a scheme to issue reduced priced parking permits for cleaner vehicles.

South Lakeland District Council expects the following measures to be completed over the course of the next reporting year:

- Increased electric charging facilities using funding from ‘Charge my street’.
- Anti – idling enforcement and education using the newly formed Locality team.
- Improving infrastructure for cycling and walking alongside flood defence improvement works in the district.

South Lakeland’s priority for the coming year is to ensure that these measures are implemented.

The principal challenges and barriers to implementation that South Lakeland District Council anticipates facing are:

- Local government reorganisation in Cumbria will lead to extensive change within the Organisation which may delay implementation of some measures.
- Public resistance to changing their travel habits is still a significant barrier.

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

- The COVID-19 pandemic has meant that resources within the Stakeholder Organisations have been diverted elsewhere, meaning that progress in some areas has been slower than others. Thankfully at SLDC, we were able to continue to monitor at all locations, allowing a full appraisal of the effects of the pandemic and changing behaviours on air quality.
- Enforcement of parking and loading restrictions in the town centre has been delayed due to resource issues. This will be addressed in future years.
- 3 of the 16 schemes identified as highway improvements are not deliverable and some measures such as traffic calming through speed humps is no longer in line with CCC policy.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Date Measure Introduced	Funding Source	Key Performance Indicator	Reduction in Pollutant/ Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Town Centre Strategy	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2019 (updated to Kendal Town Centre Strategy)	South Lakeland District Council. Internal funding	Strategy in place; measures implemented	Improved traffic flow / reduction in traffic in AQMA will reduce emissions	Masterplan now referred to as Kendal Town Centre Strategy published 2019	Report 2019. Implementation could be 3-5 years	Flexible framework for future development and investment in Kendal including car parking, the road, walking and cycling networks and the public realm. Funding required to take strategy forward, delivery mechanism established, money to be made available for projects and further feasibility studies to deliver strategy.
2	Control of HGVs & on Lowther Street	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2016-2017	South Lakeland District Council. Internal funding	% HGV on Lowther Street	HGV's emit disproportionate levels of NO2. A reduction in numbers will reduce levels	Action point now incorporated with the Town Centre Strategy and therefore this will be removed going forward.		THIS ACTION TO BE REMOVED
3	Reducing bus emissions and increasing usage	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2017	South Lakeland District Council. Internal funding	Number of buses using Kendal town centre and Lowther Street of Euro Std. 6	Older buses emit disproportionate levels of NO2. Cleaner buses will reduce levels	In July 2016 12 new Euro 6 double-deckers were introduced on the 555 Lancaster to Keswick route, which includes Lowther Street. In July 2017, 7 new Euro 6 Volvo B5 TL double	Ongoing	Voluntary reduction of emissions and improvement in standard of buses using Kendal town centre. Encouraging bus use. Further bus replacements due summer 2018 (505, 508, 516 services). Funding is an issue. Clean Bus Fund bids in 2015 and 2017 failed as Kendal was not seen to have a big enough pollution problem.

								deck (open top) vehicles added on the on 599 service. In peak summer 2016, there were 87 bus movements on Lowther Street daily, 23 (26%) were Euro 6. This was unchanged in 2018. Online customer bus tracker introduced 2016. 3 new passenger shelters installed in 2016 by Kendal BID. Clearer signage installed in 2015, linking Kendal town centre to entry points and transport links (ie railway and bus station) to encourage more use of public transport. Operators have idling policies in place. Anti-idling campaign ran Spring 2017 targeting buses and taxis in Kendal.		

4	Implementation of Kendal sustainable transport measures	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2016-2017	Cumbria County Council. Local Growth Fund	Number of schemes completed	Improved traffic flow / reduction in traffic in AQMA will reduce emissions	13 schemes out of 16 completed to date. Includes pedestrian improvements such as crossings and footpaths, cycleways, road widening and junction improvements. The remaining 3 will not be undertaken due to other restrictions. Traffic calming through speed humps no longer align with CCC policy. The final scheme A5284 Sandylands/ Appleby Road is not deliverable.	Complete	As identified in 'Kendal Transport Improvement Study'. 3 schemes removed as undeliverable.
5	Car parking review (including Park and Walk / Park and Cycle)	Traffic Management	Other	2017	South Lakeland District Council. Internal funding	Town Centre AADT's; car park usage figures	Encouraging long term parking in town centre could reduce number of cold starts, reducing emissions. Car parks on outskirts of Kendal could reduce car journeys and emissions	Car park on County Hall – that may now serve to reduce car journeys of visitors who access Kendal down Windermere Road or Burneside Road as they may be diverted to find parking at the North end of	2021	Plan to use Kendal Leisure Centre as park and walk / cycle shelved due to lack of funding as deemed "before it's time". Proving difficult as a Council to balance economy (bringing shoppers in by providing town centre parking) against the air quality benefits of keeping cars out of town. Prioritisation is a political issue. *NB reporting of figures revised in 2018 - multi-storey usage had been omitted

								Kendal before accessing the Town centre. (Although it has been used as testing centre during 2020 as part of the COVID response). Lowther Street AADT: March 2016 = 10,759; March 2017 = 11,066; March 2018 = 11,013; March 2019 = 11,371 Car park tickets sold in Kendal: 1 Jan – 31 Aug 2015 = 577,665; 1 Jan – 31 Aug 2016 = 534,629; 1 Jan - 31 Aug 2017 = 539,588; 1 Jan - 31 Aug 2018 = 564,740 1 Jan - 31 Aug 2019 = 553,889 1 Jan - 31 Aug 2020 = 607586		
6	Kendal Strategic Transport Infrastructure Study / Kendal Highways and Transport	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective	TBC	Cumbria County Council. Funding from CCC, SLDC & KTC	Strategic Study completed and measures delivered	Improved traffic flow / reduction in traffic in AQMA will reduce emissions	First phase of work commissioned July 2016. Project Officer and Steering Groups	Study complete 2019	This study considers longer term infrastructure requirements of Kendal, taking into account recent flooding events, air quality and proposed future development (including one way system, north / south travel and

	Improvements Study		vehicle priority, bus priority, high vehicle occupancy lane					appointed. Workshops undertaken with a wider technical group and political stakeholders 2016. Additional study work to pull together several previous pieces of work are now being progressed.		'Northern Development Route'). Delays due to linked projects. Study is first step and significant additional work and funding will be required prior to any delivery.
7	Public electric vehicle charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016	South Lakeland District Council. OLEV funding	Number of EV charging points installed Charging point usage	Electric vehicles have no NO2 emissions	Further to those installed in Lakes by LDNPA, 8 points installed by SLDC to date (Ambleside, Ulverston, Kirkby Lonsdale, Kendal). Booths supermarket has installed 3 charging points at their stores. Currently 1 fast and 1 rapid charger. Rapid receives more use and an ongoing increase in use is seen. Average no. charges per day at Busher Walk in Kendal 2016 (July - Dec 2016) Fast = 0.17, Rapid = 0.4;	2020	Assessing Busher Walk site prior to installation of further points at Blackhall Road. Some resistance as usage figures show low usage to date and charging points involve loss of revenue for that parking space.167k will be used to install ECP's at 'on street' parking locations in South Lakes. Locations to be finalised.

								2017 Fast = 0.27, Rapid = 0.99; 2018 Fast - 0.25, Rapid = 1.07. Bid made by partners for money to run a Charge My Street project in South Lakeland was successful (167k). This will be used to install charging points at 7 locations - locations to be finalised.		
8	Reduced price parking / parking permits for cleaner vehicles	Traffic Management	Emission based parking or permit charges	2011	South Lakeland District Council	No. of reduced price parking permits issued	Cleaner vehicles emit less NO2	Permits issued: 2011 = 1 2012 = 7 2013 = 11 2014 = 17 2015 = 25 2016 = 33 2017 = 50 2018 = 70 2019 = 54 2020 = 44	Implemented 2011. Ongoing	Discount on price of annual parking pass for Band A vehicles. Discount increased to £100 April 2017.
9	Enforcement of parking / loading restrictions	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	2011 onwards	Cumbria County Council	Number of PCN's served	Reducing congestion improves traffic flow, reducing NO2	Staff issues this year have led to less PCN's being issued. PCN's issued: 2010 = 15 2011 = 273 2012 = 254 2013 = 61 2014 = 127 2015 = 121	Ongoing	Staffing issues within the parking services team hindered performance in 2019/20.

								2016 = 138 2017 = 582 2018 = 403 2019 = 134 2020 = 170		
10	Encouraging walking	Transport Planning and Infrastructure	Other	2017	Kendal Town Council / Kendal Business Improvement District. Internal funding	Number of cars using Park and Walk sites	Walking instead of driving reduces emissions	KTC continue to distribute a Walking Trails leaflet for Kendal - will encourage walking into town from residential areas. Improvements made. SLDC liaising with CCC Public Health team to target travel to school. Kendal Bid project for Kendal Leisure Centre to become a Park and Walk / Cycle, including improved links to town centre, did not receive funding. No Park & Walk yet in operation, so no usage figures available.	Ongoing	Further measures to enhance the walkability of the town to be worked up through the Kendal Town Centre Strategy. No Park and Ride in place yet so no useable figures.
11	Encouraging cycling, enhanced cycle routes and cycle	Transport Planning and Infrastructure	Cycle network	2016-2017	Cumbria County Council. Local Growth Fund, Defra AQ grant, Health &	Length of cycleway; number of cycle stands installed; cycle counts	Cycling instead of driving reduces emissions	850m of cycleway installed in Phase 1 of Burton Rd Cycleway and 1.41km now completed in	2018/19	Cycle routes funded by Local Growth Fund. Funding was reprofiled to 2018/19 which has delayed implementation of the schemes. Cycle parking funded by Defra AQ Grant. Cycling Hub in Westmorland Shopping

	parking in Kendal				Wellbeing Board funding			Phase 2. Shap Road section to follow. Lancaster Canal Partnership implementing the Kendal to Lancaster canal cycleway to encourage cycling from Natland to Kendal. Work now started on completing missing sections of 'Kendal X', linking 4 corners of Kendal. Also potential for cycle routes to be combined in flood defence works which received planning approval early 2019. Cycle parking now installed in most SLDC car parks. 46 Defra-funded cycle stands installed in Kendal, with net increase of 25 stands, alongside 20 bike boxes installed by Kendal BID. Bike Hub installed in Westmorland Shopping Centre,		Centre delayed pending investigation of other options. Further measures to encourage cycling to be worked up through the Kendal Town Centre Master Plan. No cycle count since 2017 or 2018 due to CCC funding cuts.

								Kendal - secure bike parking, changing rooms, lockers and maintenance stand. To be publicised following Purdah. Electric Bike Network have 2 hire locations and 3 charging locations in Kendal. 1619 cyclists in Kendal in October 2015 traffic count (8.8% growth on previous year). 2016 = 1715 (5.8% growth). 2017 = no figures available 2018 = no figures available 2019 = no figures available		
12	Reducing taxi emissions	Promoting Low Emission Transport	Taxi Licensing conditions	2015	South Lakeland District Council	Policy in place. % of licensed taxis of Euro Standard 6	Cleaner vehicles emit less NO2	Taxi Licensing Policy review delayed until 2022. Anti-idling campaign ran Spring 2017 targeting buses and taxis in Kendal. Another campaign ran on Clean Air Day, with Officers from South Lakeland and Cumbria	Policy in place January 2016	Existing taxi policy addresses anti idling by drivers and has some provision for newer vehicles to be used as Hackney Carriage and Private Hire (therefore ensuring more modern engine standards) Awaiting training of locality officers to carry out education and enforcement once resources allow.

								County Council and the Police handing out leaflets to drivers found idling. Internal reorganisation has led to the employment of locality officers who will be authorised to serve Fixed Penalty Notices and carry out education/ enforcement role.		
13	Councils Climate Change Action Plan	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2016	South Lakeland District Council. Internal funding / historic Defra AQ Grant	Number of active travel projects completed.	Behaviour change to reduce car use, reducing emissions	Go Easy campaign and website has now gone. The actions are now embedded within the Councils Climate Change Action Plan.	Ongoing	Progress restricted as Project Officer not appointed. Now taken on by Health and Wellbeing Officer. Actions embedded within Council Climate Change Action Plan
14	Planning policy prioritises air quality (Local Plan Policy)	Policy Guidance and Development Management	Air Quality Planning and Policy Guidance	2016	South Lakeland District Council	CIL liabilities, CIL receipts, CIL spending decisions. Adoption of new policies	New development is air quality neutral and gives rise to no increase in NO2	Air quality considerations included in planning policy. Policies encourage active travel and control pollution to minimise the impact of development on air quality. Development Briefs for specific	CIL ongoing;- Local Plan under Review timescale up to 2040	Development above thresholds in SLDC Guidance for Developers must be air quality neutral, ie. have positive or no negative impact on air quality. All developments predicting negative impact on air quality, even negligible, are required to agree mitigation, although developers are resistant to this.

								development sites in Kendal have similar requirements. CIL adopted 1 June 2015. Potential for CIL monies to be spent on projects that support improvement of air quality in Kendal. Local Plan under review, existing policies to be reviewed		
15	20 mile per hour zones in Kendal	Traffic Management	Reduction of speed limits, 20mph zones	Unknown	Kendal Town Council. Internal funding	Number of 20mph zones	Consistent, smooth driving at lower speeds can reduce emissions	Study to be commissioned by KTC into potential for 20mph zones, but on hold pending outcome of Kendal Integrated Transport and Masterplan studies. Funding moved to 2019/20 - Studies ongoing.	Unknown	Evidence that measures such as speed bumps can cause increased vehicle emissions, but a consistent lower speed can reduce emissions. Must ensure chosen speed restrictions do not impede smooth flow of traffic. Dependant on CCC support for recommendations
16	Enhanced green infrastructure	Other	Other	2018	South Lakeland District Council / Kendal Town Council. Internal funding /	Number of projects completed	Some evidence that certain plants can remove pollutants from the air	The proposed Green Wall on Lowther Street has been rejected by the Town Council due to concerns regarding the	Unknown	Funding other projects is an issue. No further updates

					Locally Important Projects Grant			effectiveness of them. Kendal Town Council conducting studies with partners to research alternatives.		

$PM_{2.5}$ – 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. In South Lakeland in 2010 it is estimated there were 44 adult deaths attributable to $PM_{2.5}$ [4]. Public Health Indicator 3.01 reports the fraction of mortality attributable to particulate air pollution. In South Lakeland in 2017 this was 3.1% [5], lower than the regional and English values.

To address $PM_{2.5}$, South Lakeland District Council is working with the Director of Public Health at Cumbria County Council on how air quality can be prioritised in South Lakeland to help reduce the health burden from air pollution.

This includes including air pollution in Cumbria's Joint Strategic Needs Assessment through the Health and Wellbeing Board, as well as in the Cumbria Public Health Strategy, encouraging closer working and communicating health messages to the public. Work is ongoing with the Directors of Public Health in Cumbria and Lancashire, Councillors and Officers engaging following the joint report, "Air Quality and Public Health – Reducing Deaths and Ill Health Caused by Poor Air Quality in Lancashire and Cumbria" [6], which came out of the Air Quality Summit held in early 2018.

Measures in the AQAP (Table 2.2) also aim to both reduce the public's exposure to $PM_{2.5}$ and reduce other polluting emissions.

Although no national network monitoring of $PM_{2.5}$ takes place in South Lakeland, a portable monitor (AQ Mesh) has been purchased by the Council which allows monitoring in response to complaints and of hotspots. Short-term monitoring at residential properties in Kendal and alongside the continuous analyser on Lowther Street has not indicated any problems to date.

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

This section sets out the monitoring undertaken within 2019 and 2020 by South Lakeland District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

South Lakeland District Council undertook automatic (continuous) monitoring at 1 site during 2019 and 2020. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at https://uk-air.defra.gov.uk/data/

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

3.1.2 Non-Automatic Monitoring Sites

South Lakeland District Council undertook non- automatic (passive) monitoring of NO_2 at 21 sites during 2019 and 22 sites during 2020. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) 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[8], "annualisation" (where the data capture falls below 75%), and distance correction[9]. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. Note that the concentration data presented in Table A.3 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 2019 and 2020 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.

[8] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html

[9] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

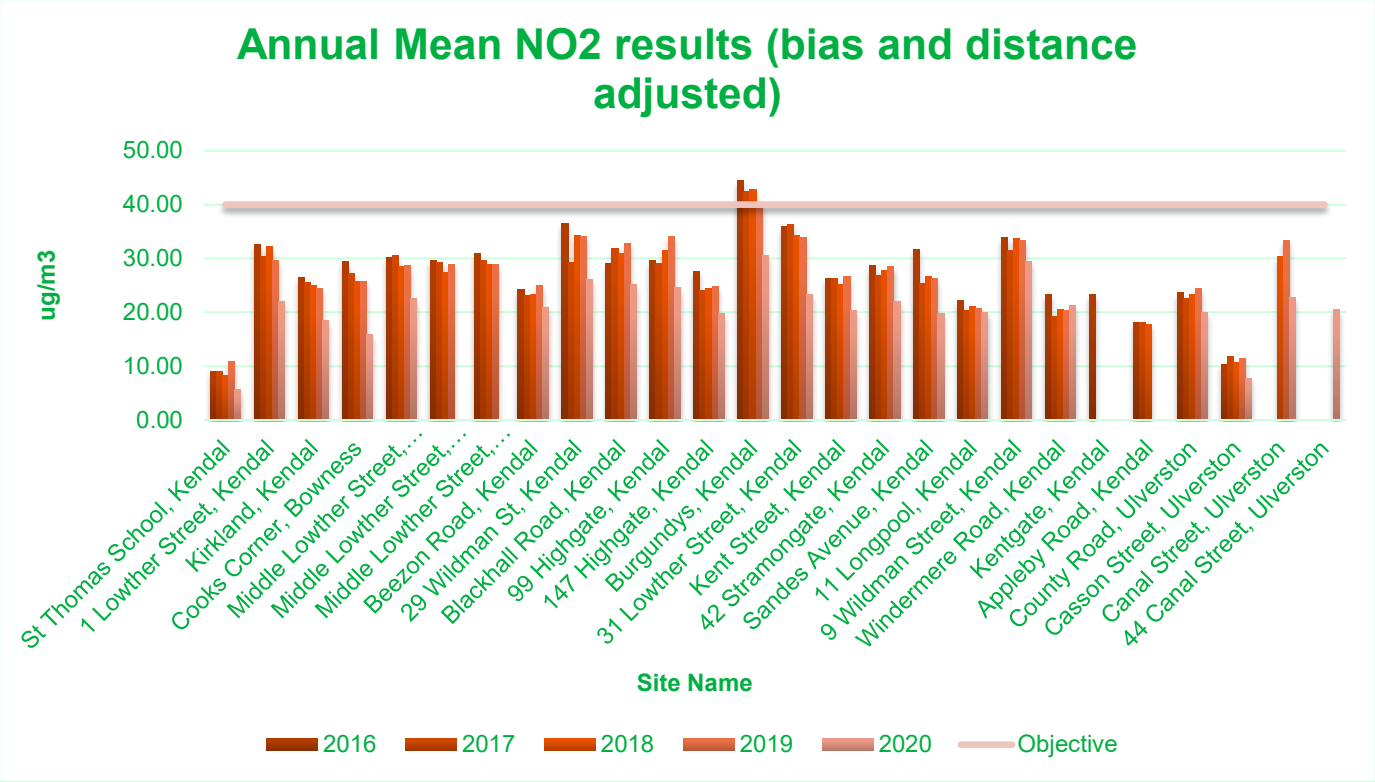


Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Monitoring has shown that in 2019, after bias adjustment and distance correction (for those sites which are not representative of public exposure) there was still only 1 site in the District that was slightly above the annual mean objective of 40µg/m^3 at a level of 40.2µg/m^3. This is site ref N25, Burgundys on Lowther St, where there is relevant exposure on the first floor. This site is already within the AQMA and was predicted using Defra's future year calculator) to meet the objective by 2020.

The 2020 monitoring data, must be viewed with caution, due to the known changes in traffic movements and behaviours during the COVID-19 pandemic. The bias adjusted and annualised results for the site show a level of 30.5µg/m^3. This is obviously a dramatic decrease compared to previous years, but is likely to be due to decreased traffic movements.

There were no other sites within 10% of the objective in 2019 or 2020.

The Council have adopted a voluntary target of 30µg/m^3, to ensure an ongoing reduction in NO_2, even when the Government objective has been met. This was being met at 14 of the 21 sites in 2019 and 21 of the sites in 2020 (1 extra site was added in 2020, meaning that 1 site is exceeding the target).

There were no exceedences of the hourly mean objective at the Lowther Street continuous analyser in 2019 or 2020 (the worst case monitoring location) and no sites at which annual means were greater than 60µg/m^3, (which would indicate an exceedance is likely at these sites).

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
A1	Lowther Street	Kerbside	351610	492650	NO NOx NO2	Yes	Chemiluminescence	0	0.83	3

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

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)
N4	St Thomas' School, Kendal	Urban Background	351100	493720	NO2	No	6.4	2.9	No	2.6
N9	1 Lowther St, Kendal	Kerbside	351490	492610	NO2	No	0.0	0.9	No	2.9
N17	Kirkland, Kendal	Roadside	351570	492410	NO2	Yes	0.5	4.1	No	3.0
N18	Cooks Corner, Bowness	Roadside	340340	497010	NO2	No	0.0	1.9	No	2.6
N19	Beezon Road, Kendal	Kerbside	351897	493022	NO2	Yes	3.2	0.5	No	2.5
N20	29 Wildman Street, Kendal	Roadside	351970	493070	NO2	Yes	0.5	1.5	No	2.6
N21	Blackhall Rd, Kendal	Roadside	351680	492840	NO2	Yes	0.0	2.3	No	2.5
N23	99 Highgate, Kendal	Kerbside	351484	492434	NO2	Yes	1.8	0.8	No	2.4
N24	147 Highgate, Kendal	Roadside	351499	492314	NO2	Yes	0.0	2.7	No	3.1
N25	Burgundy's Kendal	Kerbside	351557	492624	NO2	Yes	0.0	0.9	No	2.6
N26	31 Lowther St, Kendal	Kerbside	351619	492637	NO2	Yes	0.0	0.8	No	2.6
N27	Kent Street, Kendal	Roadside	351674	492695	NO2	Yes	5.1	2.6	No	2.4
N31	42 Stramongate, Kendal	Roadside	351712	492832	NO2	Yes	0.6	2.8	No	2.4
N33	Sandes Ave, Kendal	Roadside	351597	493052	NO2	Yes	0.7	2.7	No	2.4
N36	11 Longpool, Kendal	Kerbside	352016	493142	NO2	Yes	3.3	0.6	No	2.5
N37	9 Wildman St, Kendal	Roadside	351934	493043	NO2	Yes	0.0	1.5	No	2.5
N38	Windermere Rd, Kendal	Roadside	351499	493022	NO2	Yes	12.0	1.5	No	2.5
N41	County Road, Ulverston	Roadside	328698	478158	NO2	No	5.8	2.2	No	2.5
N43	Casson St, Ulverston	Urban Background	329049	478471	NO2	No	0.3	1.1	No	2.6
N46	Canal Street, Ulverston	Kerbside	329316	478554	NO2	No	0.0	1.3	No	2.5

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)
SLAKE/20A/NWB3S1	Canal Street, Ulverston	Kerbside	329356	478604	NO2	No	0.0	1.3	No	2.5
N11, N13, N14	24 Lowther St, Kendal	Kerbside	351605	492640	NO2	No	0.0	0.8	Yes	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.3.1 – Annual Mean NO_2 Monitoring Results 2019: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2015	2016	2017	2018	2019
A1	351610	492650	Roadside	66.4	66.4	32.58	30.36	27.42	21.92	25.72

Table A.4.2 – Annual Mean NO_2 Monitoring Results 2020: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
A1	351610	492650	Roadside	98	98	30.36	27.42	21.92	25.72	21.0

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

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

Notes:

The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

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%).

Table A.5 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

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 2020 (%) (2)	2016	2017	2018	2019	2020
N4	351100	493720	Kerbside	70.1	79.1	9.1	9.04	8.3	8.6	5.6
N9	351490	492610	Kerbside	79.1	79.1	32.6	30.27	32.2	29.6	22.1
N17	351570	492410	Roadside	79.1	63.7	27.04	26.06	25.4	25	18.5
N18	340340	497010	Roadside	63.7	71.4	29.42	27.29	25.7	25.8	15.9
N19	351897	493022	Kerbside	71.4	79.1	32.1	29.7	29.6	35.6	20.9
N20	351970	493070	Roadside	79.1	79.1	38.33	30.55	35.9	32.7	26.1
N21	351680	492840	Roadside	79.1	79.1	29.13	31.94	30.9	32.3	25.1
N23	351484	492434	Kerbside	79.1	79.1	35.13	32.45	35.2	34	24.6
N24	351499	492314	Roadside	79.1	70.1	27.61	24.02	24.4	24.8	19.7
N25	351557	492624	Kerbside	70.1	79.1	**44.45**	**42.54**	**42.9**	**40.2**	30.5
N26	351619	492637	Kerbside	79.1	79.1	35.98	36.44	34.2	33.9	23.3
N27	351674	492695	Roadside	79.1	79.1	32.17	29.34	27.9	29.9	20.4
N31	351712	492832	Roadside	79.1	79.1	29.61	27.63	28.5	29.3	22.1
N33	351597	493052	Roadside	79.1	79.1	32.95	26.48	27.2	27.4	19.8
N36	352016	493142	Kerbside	79.1	79.1	28.53	25.15	25.7	25.7	20.0
N37	351934	493043	Roadside	79.1	62.4	33.81	31.39	33.7	33.3	29.5
N38	351499	493022	Roadside	62.4	70.1	34.95	27.5	29.3	29.3	21.2
N41	328698	478158	Roadside	70.1	79.1	30.19	26.56	27.3	29	20.0
N43	329049	478471	Urban Background	79.1	79.1	10.33	11.92	10.7	11.7	7.8
N46	329316	478554	Kerbside	79.1	79.1			30.3	33.3	22.7
SLAKE/20A/NWB3S1	329356	478604	Kerbside	79.1	70.1					20.5
N11, N13, N14	351605	492640	Kerbside	70.1	79.1	30.23	29.86	28.2	28.8	22.5

☒ **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 µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. 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_2 Concentrations – Outside Kendal

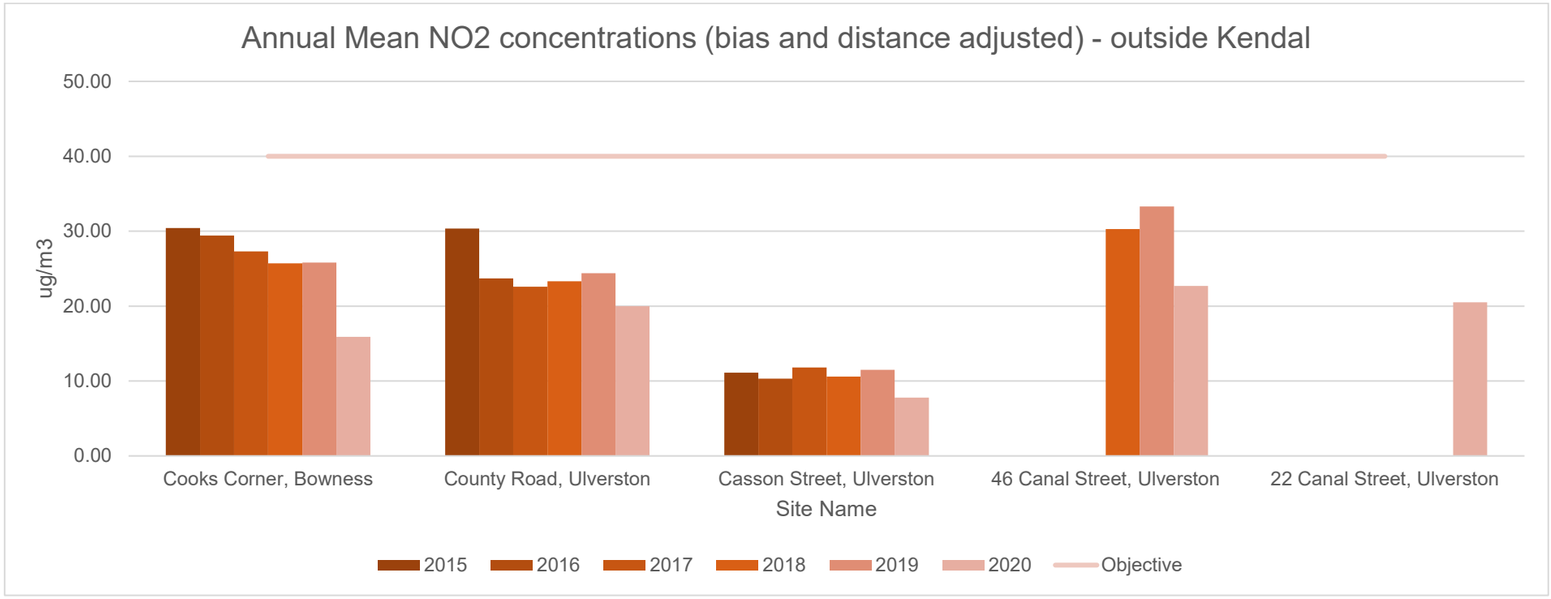


Figure A.2 – Trends in Annual Mean NO_2 Concentrations – Kendal

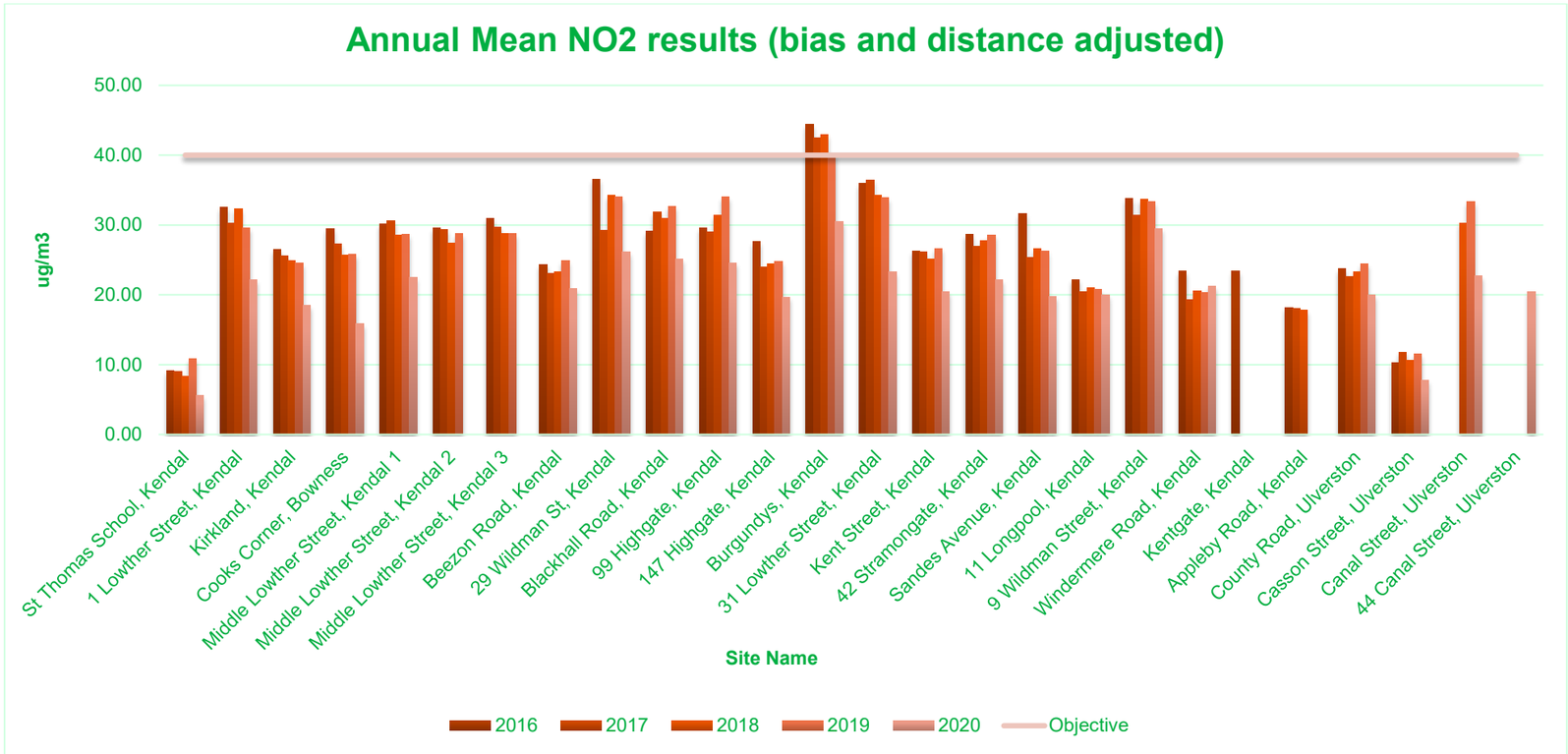


Table A.6.1 – 2019 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2015	2016	2017	2018	2019
A1	351610	492650	Roadside	66.4	66.4	0	0	0	**0**	**0**

Table A.7.2 – 2020 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
A1	351610	492650	Roadside	98	98	0	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

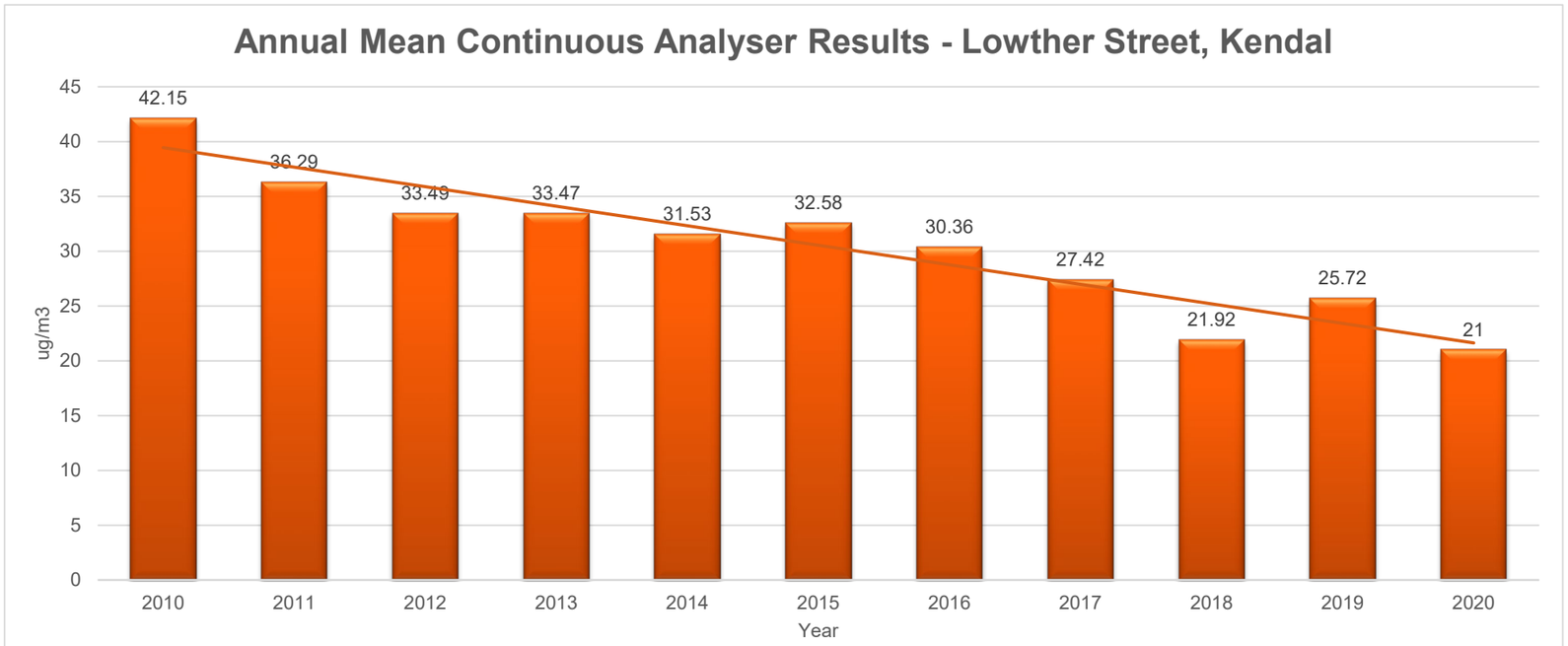
Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

Figure A.3 Trends in Annual Mean NO_2 Concentrations Analyser Results – Lowther Street, Kendal



Appendix B: Full Monthly Diffusion Tube Results

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)													
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
															Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
N4	351100	493720	16.8	18.6	12.1	8.0	6.5	6.9	6.0	8.3	10.7	13.3	15.5	13.1	11.3	8.6	-
N9	351490	492610	**51.1**	**45.4**	**47.4**	**45.8**	37.7	32.0	6.6	31.8	38.9	**44.3**	**47.1**	**41.0**	39.0	29.6	-
N11, N13, N14	351605	492640	**48.2**	**45.5**	**42.9**	35.6	33.7	30.8	30.8	29.6	36.7	**43.7**	**43.2**	35.1	37.9	28.8	-
N17	351570	492410	**44**	**44.2**	**41.3**	25.2	25.3	25.2	25.2	25.7	32.5	35.5	35.5	35.6	32.9	25.0	-
N18	340340	497010	32.3	39.4	33.2	26.2	32.1	34.7	34.7	35.8	32.8	35.2	33	30.7	33.9	25.8	-
N19	351897	493022	**56.8**	**53.1**	**42.5**	37	34.2	32.7	32.7	31.3	**40**	**52.5**	**60.8**	**36.5**	**42.5**	32.7	-
N20	351970	493070	**56.3**	**60.6**	**54.5**	**41.6**	**40.5**	**40.3**	**40.3**	**40.2**	**46.4**	**50.8**	**49.4**	**41.1**	**46.8**	35.6	-
N21	351680	492840	**52.4**	**51.9**	**47.6**	34.3	36	38.3	38.3	**40.7**	**41**	**46.4**	**46.5**	**43.5**	**42.5**	32.3	-
N23	351484	492434	**59.3**	**56.5**	**44.2**	**44.4**	39.9	31.7	31.7	30	**45.7**	**53.4**	**57.4**	**42.9**	**44.8**	34.0	-
N24	351499	492314	**42.8**	26.1	31.7	37.2	30.8	23.6	23.6	23.1	31.4	39.5	47.3	_	32.6	24.8	-
N25	351557	492624	**65.6**	**60.6**	**59.7**	**54.3**	**53.4**	**41.4**	**41.4**	35.8	**50.7**	**55.5**	**65.9**	**49.9**	**52.9**	**40.2**	-
N26	351619	492637	**59.6**	**52.2**	**52.4**	**40.3**	38.5	34.5	34.5	35	**40.9**	**50.8**	**50.1**	**46.9**	**44.6**	33.9	-
N27	351674	492695	**50.7**	**46.6**	38.2	36.8	32.3	33.5	33.5	30.6	38.3	**43.4**	**48.1**	39	39.3	29.9	-
N31	351712	492832	**45.9**	**47.6**	38	**40.9**	32.4	31.5	31.5	26.9	35.1	**45.6**	**50.9**	37.4	38.6	29.3	-
N33	351597	493052	**46.8**	34.2	**42.3**	35.7	_	25.9	25.9	26.2	34	**44.5**	**43.5**	38.6	36.1	27.4	-

N36	352016	493142	**42.7**	**42.2**	37.5	38.8	22.8	26.3	26.3	24.9	31.5	**41.7**	**41.2**	29.7	33.8	25.7	-
N37	351934	493043	**52.3**	**51.7**	**43.4**	**52.2**	**40.1**	38.7	38.7	36.2	**40.5**	**47.6**	**43.8**	**40.8**	**43.8**	33.3	-
N38	351499	493022	**50.7**	**46.4**	38.4	37.7	34.3	28.6	28.6	27.9	37.7	**45.5**	**53.3**	34	38.6	29.3	-
N41	328698	478158	**48.9**	**41.6**	38.5	**42.3**	31.6	30.2	30.2	29.4	35.3	**44.3**	**52.6**	33.5	38.2	29.0	-
N43	329049	478471	20.6	23.1	12.1	14.7	8.5	8.8	8.8	16.8	14.9	19.2	22.9	14.7	15.4	11.7	-
N46	329316	478554	**55.2**	**56.1**	**51.7**	32.4	**41.7**	39.1	39.1	**41.3**	**44.7**	**45.6**	**41.7**	37.1	**43.8**	33.3	-

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.
(2) Distance corrected to nearest relevant public exposure.

Table B.2.2 – NO_2 2020 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted	Annual Mean: Distance Corrected to Nearest Exposure	Comment
N4	351100	493720	7.4	8.6	4.6			5.9	4.0		9.3		18.8		7.7	5.6	-	
N9	351490	492610	16.7	38.4	22.8			29.4	23.0	30.8	35.3		37.1		29.3	22.1	-	
N11	351605	492640	38.8		20.9			24.4	22.1	28.0	33.4		35.2		-	-	-	Triplicate Site with N11, N13 and N14 - Annual data provided for N14 only
N17	351570	492410	19.7	35.4	19.7					19.9	32.3		37.6		27.0	18.5	-	
N18	340340	497010	15.5	30.4	15.0				0.8	26.7	30.8		23.1		21.9	15.9	-	
N19	351897	493022	20.9	38.3	20.6			13.2	19.1	29.9	35.6		40.7		27.6	20.9	-	
N20	351970	493070	24.3	43.1	24.6			18.2	30.4	37.3	44.9		50.4		34.6	26.1	-	
N21	351680	492840	24.5	46.7	20.3			26.5	27.0	28.9	43.7		47.7		33.3	25.1	-	
N23	351484	492434	24.0	40.6	21.2			27.0	22.4	32.8	41.6		54.2		32.6	24.6	-	
N24	351499	492314		31.1	19.1			23.7	15.6	24.0	26.5		31.8		24.2	19.7	-	
N25	351557	492624	29.1	43.4	31.3			37.3	35.9	40.9	48.4		59.9		40.4	30.5	-	
N26	351619	492637	24.0	42.8	19.4			26.6	26.8	28.4	37.0		48.5		30.9	23.3	-	
N27	351674	492695	20.7	32.1	17.2			27.2	20.9	24.1	33.0		46.9		27.0	20.4	-	
N31	351712	492832	22.0	34.5	19.2			25.4	19.4	26.8	37.6		53.4		29.2	22.1	-	
N33	351597	493052	16.9	32.3	16.6			25.3	19.6	26.7	34.3		36.9		26.3	19.8	-	
N36	352016	493142	18.7	31.1	18.8			27.8	19.2	28.6	31.8		37.0		26.5	20.0	-	
N37	351934	493043			25.2			33.1	26.2	35.9	42.3		47.2		35.2	29.5	-	
N38	351499	493022		2.2	21.0			24.9	16.6	29.6	37.1		39.3		26.0	21.2	-	
N41	328698	478158	19.3	30.2	21.7			23.7	20.5	27.2	30.6		44.3		26.5	20.0	-	
N43	329049	478471	9.9	13.2	8.6			7.0	4.6	8.4	12.9		20.4		10.4	7.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted	Annual Mean: Distance Corrected to Nearest Exposure	Comment
N46	329316	478554	23.8	40.1	21.5			28.4	30.9	29.1	33.3		39.5		30.1	22.7	-	
SLAKE/20A/NWB3S1	329356	478604		35.0	16.7			21.1	22.0	23.8	28.2		31.8		25.1	20.5	-	
N13	351605	492640	38.9	37.6	21.8			24.0	21.3	24.5	36.2		35.2		-	-	-	Triplicate Site with N11, N13 and N14 - Annual data provided for N14 only
N14	351605	492640	38.4	38.7	20.4			14.0	20.6	25.1	34.7		38.3		29.8	22.5	-	Triplicate Site with N11, N13 and N14 - Annual data provided for N14 only

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**

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

☒ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column**

☒ **SLDC confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

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 South Lakeland District Council During 2019/2020

South Lakeland District Council has not identified any new sources relating to air quality within the reporting year of 2019/20.

It is now recognised that Local Authorities will have assessed all known sources in their District through previous rounds of review and assessment. Any new or modified sources will be assessed for their impact on air quality though the planning application process.

South Lakeland District Council Environmental Protection Group is consulted on all applications which may impact on air quality and requires that all development is air quality neutral. This means developments are not affected by poor air quality and they either improve, or have no negative impact on air quality themselves.

Any new or modified source identified will be assessed using the tools in LAQM (TG16) (updated in February 2018). Sources which will be assessed include new developments which lead to an increase in traffic (including the proportion of HGV's), biomass boilers and Combined Heat and Power (CHP) plant, new industrial sites or changes to existing industrial sources, new or altered roads or junctions, bus stations, airports and railways and any uncontrolled or fugitive sources (such as construction sites).

South Lakeland District Council will continue to review developments to ensure sources are assessed if they meet the criteria in TG16.

Work to strengthen local planning policy when looking at requirements for air quality is ongoing.

Additional Air Quality Works Undertaken by SLDC During 2019/20

SLDC has not completed any additional works within the reporting year of 2019/20.

QA/QC of Diffusion Tube Monitoring

South Lakeland District Council's diffusion tubes are supplied and analysed by Environmental Scientifics Group (ESG) using 20% triethylamine (TEA) in water by UKAS accredited SOCOTEC.

The samples have been analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance.'

The tubes were prepared by spiking water:triethanolamine (80:20) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. All samples were received in good condition, unless otherwise stated in the comments field of results table. Please note:

(i) As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11^{o}C, the reported values **have** been adjusted to 20^{o}C to allow for direct comparison with EU limits.

In the AIR NO_2 PT proficiency testing scheme, 100% of results submitted in 2019 and 2020 by SOCOTEC (formerly ESG), who supply and analyse the Council's diffusion tubes, were subsequently determined to be satisfactory. Their test method for NO_2 tubes meets the guidelines in Defra's guidance for diffusion tube monitoring and they are UKAS accredited.

Diffusion tubes are installed and changed each month by the Council according to the Council's document "Procedure for Air Quality Monitoring" and in accordance with Defra's documents "Diffusion Tubes for Ambient Monitoring: Practical Guidance" and TG(16). Spurious or unusual diffusion tube results are removed from the data set.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within SLDC in 2019 recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

In 2020 the data was entered into DEFRA's diffusion tube processing tool and where necessary, data was annualised. This was necessary in 2020 as there were some

difficulties in collecting tubes during some months due to COVID restrictions nationally and locally.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2019/20 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/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

SLDC have applied a local bias adjustment factor of 0.68 to the 2019 monitoring data and a national bias adjustment of 0.74 to the 2020 monitoring data. A summary of bias adjustment factors used by SLDC over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor used	Local factor for comparison purposes (not used)
2020	National	09/21	0.74	0.72
2019	National	09/20	0.76	0.64
2018	National	06/19	0.74	0.57
2017	National	09/18	0.71	0.65
2016	National	06/17	0.75	0.74

It is recognised that local results are more representative of local circumstances. However, the locally derived figure was very low in 2019 and its use would reduce diffusion tube results massively.

It was therefore decided that the national factor of 0.76, which is more similar to previous years factors, will be used to bias adjust the 2019 data, to give worst case results. In 2020 the national factor was used to provide consistency with previous years. The local and national figure were only 0.2 difference.

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within SLDC required distance correction during 2020.

QA/QC of Automatic Monitoring

South Lakeland District Council has, since 1999, used a US-EPA, TÜV and Netcen-accredited Horiba APN 360 ambient air quality analyser. This is situated in the basement of the Council Offices on Lowther Street, within the AQMA. The analyser self-calibrates and is also calibrated and the results checked weekly by the Local Authority, with a 6-monthly service and calibration visit by the supplier. The calibration factor is automatically applied to the raw data. Access is available to an engineer at short notice if required.

Data is validated and ratified to the LAQM (TG16) standards using the AURN methodology by a third party (Air Quality Data Management) prior to publishing. As part of this contract, all data, diagnostics and any alarms are downloaded automatically at least twice a day, seven days a week. Performance is checked daily looking for the first sign of a fault.
The analyser however, is now over 20 years old and a decision will be made as to whether to keep it.

Automatic Monitoring Annualisation

The automatic monitoring locations within SLDC recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

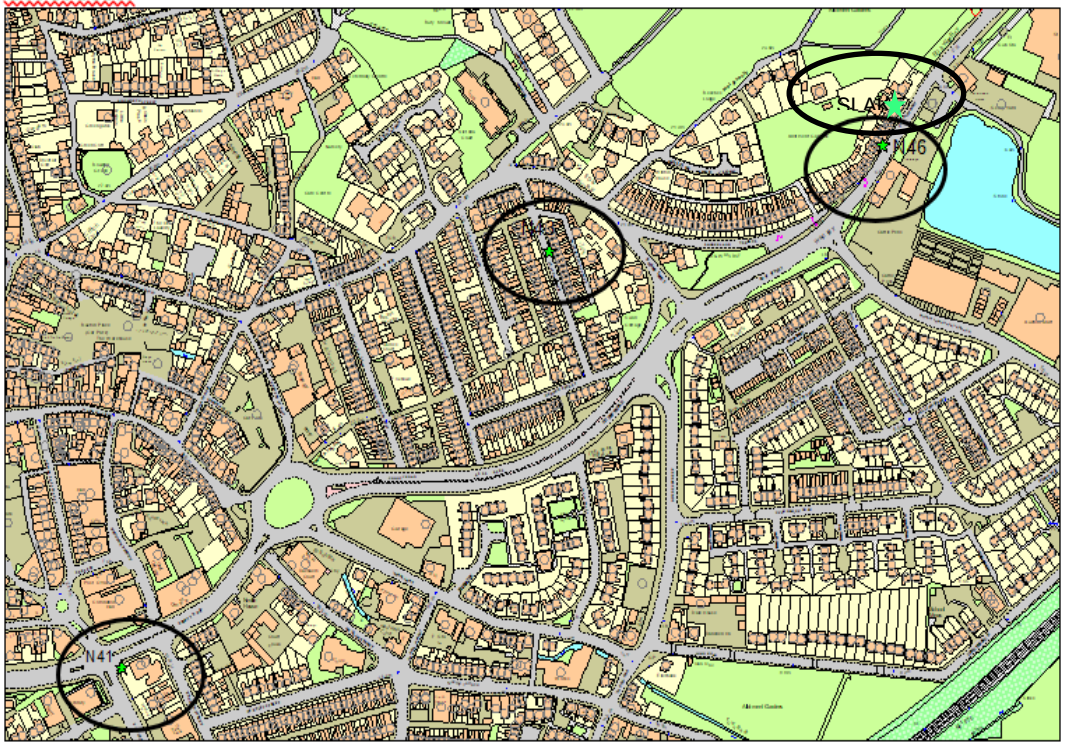
Site ID	Annualisation Factor Blackpool	Annualisation Factor Preston	Annualisation Factor Blackburn	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
N4	0.9648	0.9878	0.9929		0.9818	7.7	7.6	
N9	1.0055	1.0325	1.0213		1.0198	29.3	29.9	
N11	1.0055	1.0325	1.0213		1.0198	-	-	*Triplicate Site with N11, N13 and N14 - Annual data provided for N14 only*
N17	0.9023	0.9430	0.9425		0.9293	27.0	25.1	
N18	0.9658	0.9988	0.9864		0.9837	21.9	21.5	
N19	1.0055	1.0325	1.0213		1.0198	27.6	28.2	
N20	1.0055	1.0325	1.0213		1.0198	34.6	35.3	
N21	1.0055	1.0325	1.0213		1.0198	33.3	34.0	
N23	1.0055	1.0325	1.0213		1.0198	32.6	33.3	
N24	1.1048	1.1240	1.0780		1.1023	24.2	26.6	
N25	1.0055	1.0325	1.0213		1.0198	40.4	41.2	
N26	1.0055	1.0325	1.0213		1.0198	30.9	31.5	
N27	1.0055	1.0325	1.0213		1.0198	27.0	27.5	
N31	1.0055	1.0325	1.0213		1.0198	29.2	29.8	
N33	1.0055	1.0325	1.0213		1.0198	26.3	26.8	

Site ID	Annualisation Factor Blackpool	Annualisation Factor Preston	Annualisation Factor Blackburn	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
N36	1.0055	1.0325	1.0213		1.0198	26.5	27.0	
N37	1.1374	1.1595	1.1027		1.1332	35.2	39.8	
N38	1.1048	1.1240	1.0780		1.1023	26.0	28.6	
N41	1.0055	1.0325	1.0213		1.0198	26.5	27.1	
N43	1.0055	1.0325	1.0213		1.0198	10.4	10.6	
N46	1.0055	1.0325	1.0213		1.0198	30.1	30.7	
SLAKE/20A/NWB3S1	1.1048	1.1240	1.0780		1.1023	25.1	27.6	
N13	1.0055	1.0325	1.0213		1.0198	-	-	*Triplicate Site with N11, N13 and N14 - Annual data provided for N14 only*
N14	1.0055	1.0325	1.0213		1.0198	29.8	30.4	*Triplicate Site with N11, N13 and N14 - Annual data provided for N14 only*

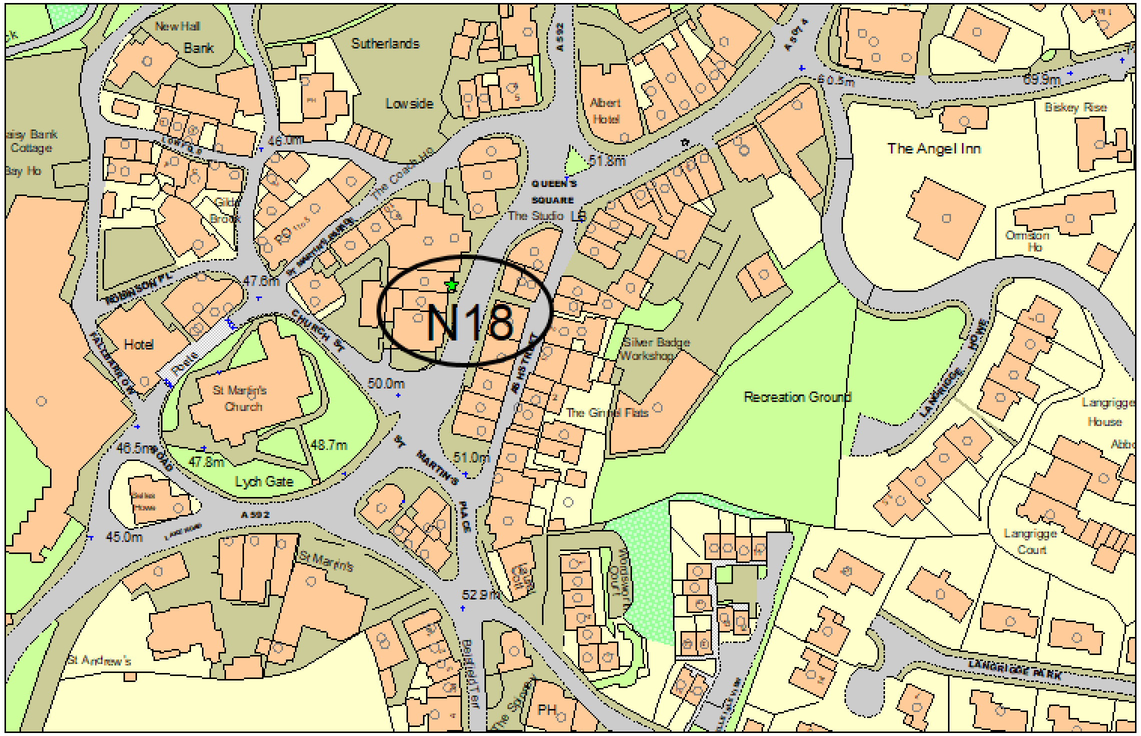
Appendix D: Map(s) of Monitoring Locations and AQMAs

Automatic Monitor location

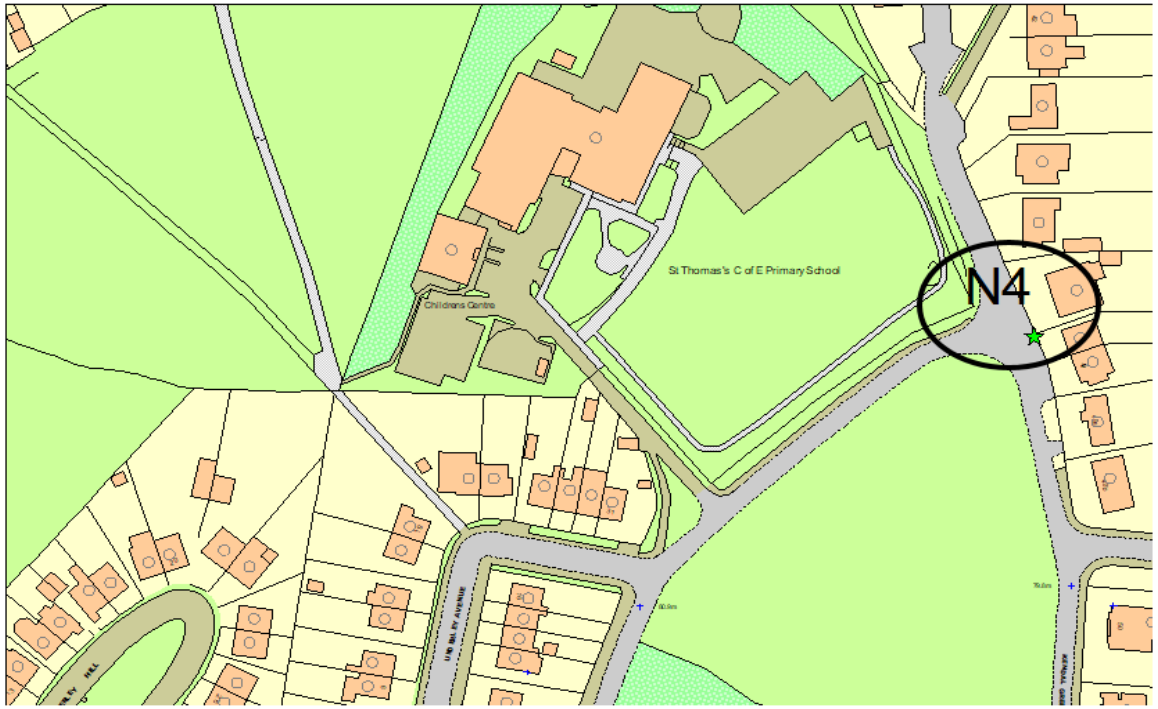
Ulverston



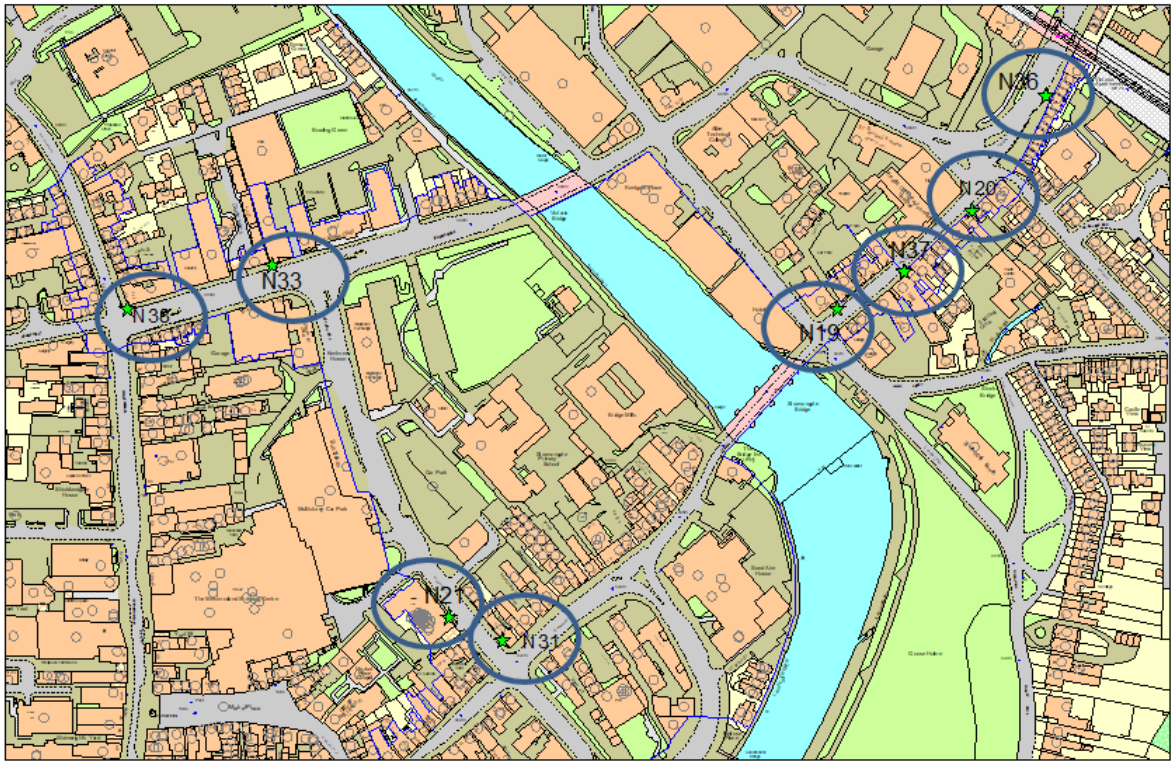
Bowness


N18
New Hall
Bank
Sutherlands
Lowside
Albert Hotel
46.0m
51.8m
QUEEN'S SQUARE
The Studio
The Angel Inn
Biskey Rise
69.9m
Ormston Ho
47.6m
CHURCH ST
Hotel
St Martin's Church
50.0m
Silver Badge Workshop
Recreation Ground
Langrigge House
46.5m
47.8m
48.7m
Lych Gate
51.0m
A 592
45.0m
St Martin's
52.9m
Langrigge Court
LANGRIGGE PARK
St Andrew's
PH

Kendal 1



Kendal 2



Kendal 3

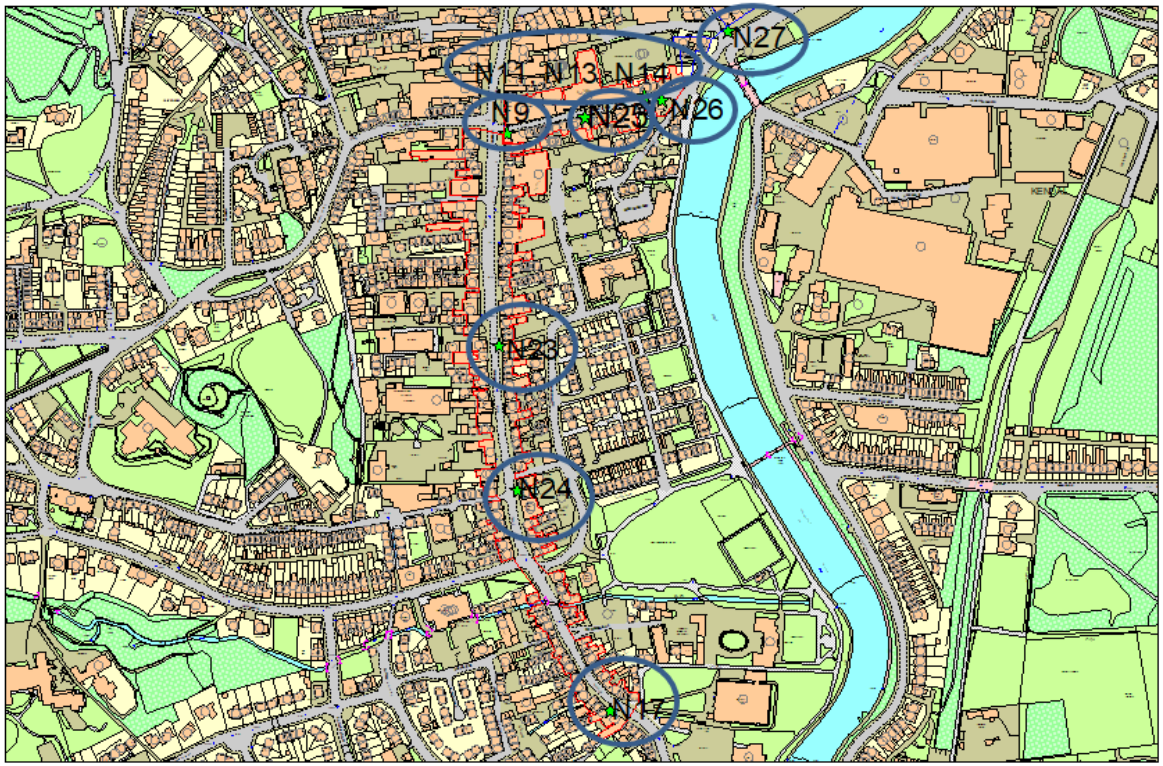
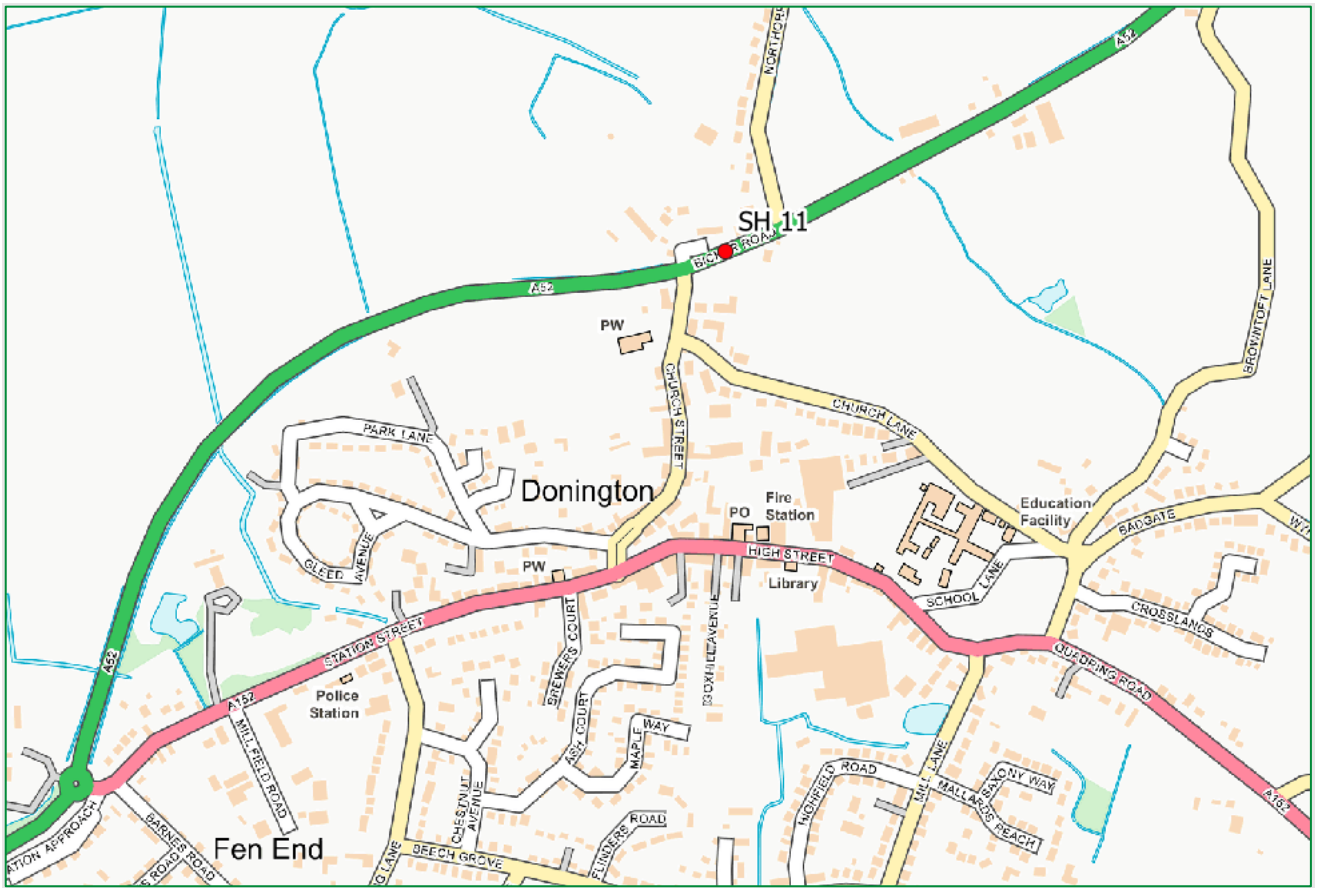


Figure D.1 – Map of Non-Automatic Monitoring Site



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[10]

Pollutant	Air Quality Objective: 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

[10] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[11] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[12] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

[11] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[12] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within SLDC

Examples of suggested content include:

- A significant reduction was reported across all sites and a reduction of NO_2 concentrations of 24.1% was experienced at N25 (which is usually above the national objective and is located within the AQMA). The reduction in NO_2 experienced within 2020 has allowed the Council to provide an evidence base in relation to the annual mean objective being achievable.

Opportunities Presented by COVID-19 upon LAQM within SLDC

No LAQM related opportunities have arisen as a consequence of COVID-19 within SLDC.

Challenges and Constraints Imposed by COVID-19 upon LAQM within SLDC

- During 2020, we were unable to monitor every month due to local or national restrictions. Therefore, it was not possible to maintain diffusion tube exposure periods for some months in line with the national monitoring calendar for a number of sites. This has affected data capture within 2020, resulting in monitoring sites having to be annualised. **Medium Impact**

The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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 Highways England
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

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