2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: June, 2023

Information	Allerdale Borough Council Local Details
Local Authority Officer	Stephen Bewsher
Department	Environmental Health
Address	Cumberland Council, Allerdale House, Workington, Cumbria, CA14 3YJ
Telephone	0300 373 3730
E-mail	Environmental.Health@cumberland.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in the Allerdale Borough Council area

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

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

In 2022 monitoring of Nitrogen Dioxide was carried out in Allerdale via diffusion tube monitoring sites. The sites were positioned at 18 locations across Allerdale deemed to be most affected by road traffic pollution and worst case. As with previous years of monitoring the 2022 data demonstrates Nitrogen Dioxide levels are well below the national objectives. The observed overall trends for 2022 continue to show reductions in levels of Nitrogen Dioxide compared to 2019 in most areas with respect to the public health guidance to restrict movement regarding COVID-19 in 2020/21.

The main pollutant of concern for Allerdale Borough Council is Nitrogen Dioxide (NO_2) which is predominantly associated with road traffic sources and other transport links. Other pollutants of concern include Particulate Matter in the form of PM_{10} and $PM_{2.5}$. Allerdale Borough Council takes a proactive approach to tackling these pollutants via smoke control areas, environmental permitting, planning requirements and regulatory duties under the Clean Air Act 1993 and incoming Environmental Act 2021. Data from 2019 that has been collated and modelled by United Kingdom Health Security Agency (UKHSA) (what was

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

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

[3] Defra. Air quality appraisal: damage cost guidance, January 2023

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

Public Health England) and shows Allerdale has the lowest human exposure to fine particulate matter (in the form of PM_{10} and $PM_{2.5}$) across North West of England and the second lowest across England (Public Health Outcomes Framework 2019).

Allerdale Borough Council does not currently sample for SO_2 however brief studies and screening were previously carried out in relation to identifying possible SO_2 hotspots in 2017. This initial screening discounted the need for detailed assessment in relation to SO_2.

Allerdale Borough Council works closely with neighbouring local authorities as well as Cumbria County Council, Environment Agency, Natural England and UKHSA to regulate and reduce air pollution. Including the recent publication of the Joint Public Health Strategy 2019 which is inclusive of the effects of air pollution in the community (Cumbria County Council, 2019).

Overall due to the good quality of our air demonstrated by monitoring and data gathered, there are no requirements for any Air Quality Management Areas (AQMA) in Allerdale at the time of reporting. Allerdale Borough Council recognises the increasing significance of maintaining good air quality for the good health of the community and will continue to pursue further proactive improvements where appropriate.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan[5] sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term $PM_{2.5}$ targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce $PM_{2.5}$ in their areas. The Road to Zero[6] details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important

[5] Defra. Environmental Improvement Plan 2023, January 2023

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

given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

In July 2021, the Government announced that plans and work for reorganisation of Local Government in Cumbria for a new unitary authority by 1st April 2023. Cumberland Council was created on the 1st April 2023. In 2022 work was taken to link our activities with those of similar groups attached to Cumbria County Council, Carlisle City Council and Copeland Borough Council to harmonise our activities in advance of Local Government Reorganisation in 2023.

Through the Zero Carbon Cumbria Partnership, to make Cumbria the first carbon-neutral county in the UK by 2037, Allerdale Borough Council continued to work on the outcomes of the carbon audit for Cumbria which will continue under Cumberland Council. The Allerdale Climate Change Advisory group offered further Carbon Literacy Training sessions for all staff members on behalf of Allerdale Borough Council in 2022. Allerdale Borough Council's final summary report published in March 2023 can be viewed in full at: https://www.allerdale.gov.uk/en/your-environment/climate-change/climate-change-action-plan/.

In June 2022, Allerdale Borough Council working with Carlisle City Council come up with a plan to save the 93/93A bus service between Bowness-on-Solway and Carlisle. The 2 district Councils have stepped in to subside the service for 12 months with each Council contributing £6,000 towards the costs. Although not a statutory responsibility to fund bus services this support is part of Allerdale's Council Strategy and the fundamental principles of the Cumberland Council approach.

In August 2022, Allerdale Borough Council working with Cumbria County Council and West House submitted the 'Workington Gateway' application to the Government's Levelling Up Fund. The plans aim to increase highway capacity and decrease congestion levels near the DT6/6B monitoring location. In addition, introduce improvements to local cycling and walking facilities and deliver s strong legacy for the development of Workington and to the new Cumberland Council. More information on progress will be provided in subsequent reporting years.

Allerdale Borough Council continues to recognise that it is important to raise the awareness of emissions which may harm health and contribute to emissions (See Image 1). Thus therefore takes a proactive approach in terms of communications within the Councils'

Communications Strategy. In particular, Allerdale Borough Council recognises the importance on understanding particulate matter and the risks this may present. Burning wood and coal in open fires and stoves totals up to 38% of the UK's emissions of particulate matter ($PM_{2.5}$) (Defra 2019). Image 2 shows the difference in particulate emissions inside your home from the different heating choices available.

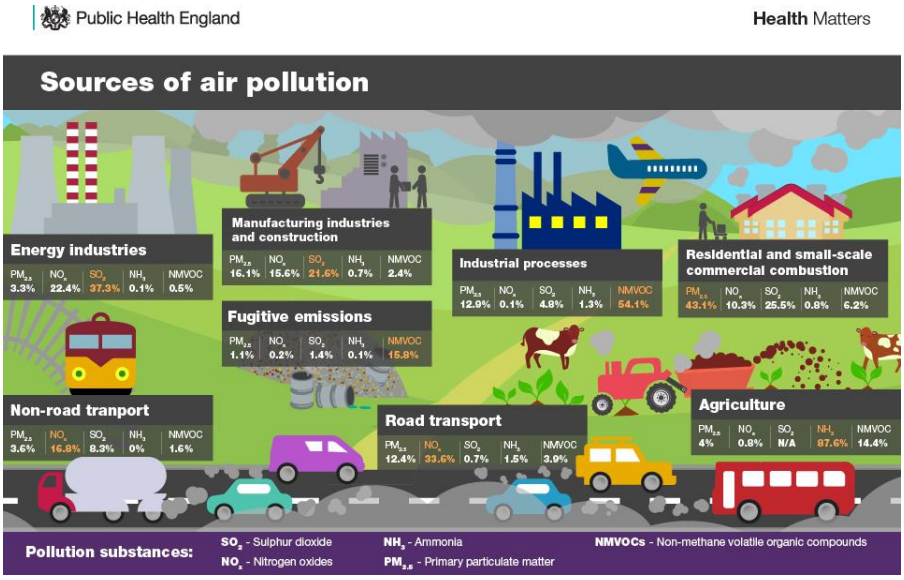


Image 1: An image presenting the sources of air pollution (Public Health England 2018)

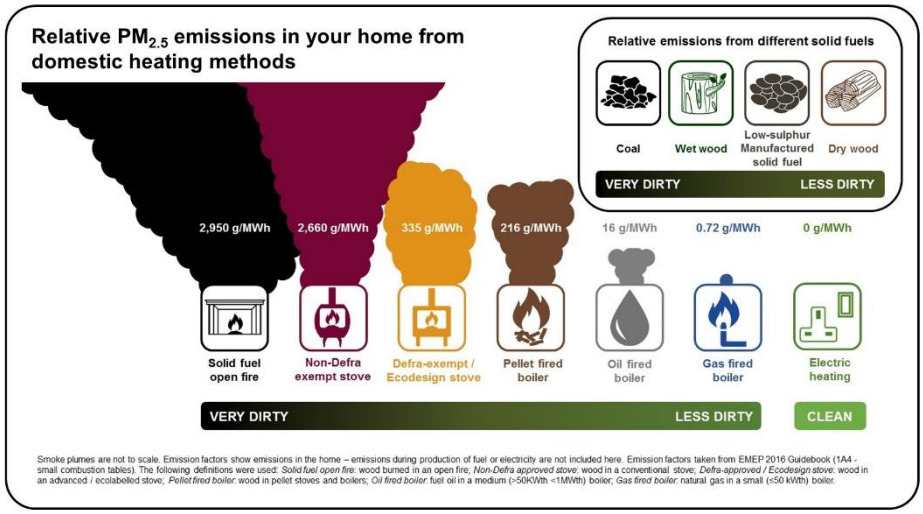


Image 2: An image presenting the relative particulate emissions inside your home from different heating methods (Defra 2018)

in May 2021 introduced the banning the sale of polluting wet wood and house coal is intended to promote real change, with requirements for Ready to Burn certification scheme to give customers and sellers a clear indication of what fuel is ready to burn (Hetas 2021). More information on the Woodsure certification scheme and where you can find local suppliers are available here: https://woodsure.co.uk/.

Further legislation changes regarding Smoke Control Legislation introduced in May 2022 under the Environmental Act 2021: The Environment Act 2021 (Commencement No. 2 and Saving Provision) Regulations 2022 (legislation.gov.uk). Allerdale Borough Council working with partner neighbouring local authorities has been working on developing and updating a new Smoke Control Area Policy and Air Quality Strategy.

For Clean Air Day 2022, Allerdale Borough Council hosted a Walk Allerdale Challenge and run a 'Clean Up Event'. The challenge encouraged participants to record their daily steps in an attempt to encourage active travel and understand the links associated with improving health and environment whilst also partaking in a clean up event. Communications were made via newsletters with a press release was also released to other local media contacts and other local council buildings. Communication via social media platform such as Twitter demonstrated that Clean Air Day 2022 had resulted in 1205 impressions. Messages of the importance of collective action to improve outdoor and indoor air pollution has been delivered through Allerdale Borough Council's communications. Furthermore working with colleagues in Active Cumbria whereby a Safe Parking Pledge 'Design A Postcard Competition' was held amongst local schools. Preparations are currently ongoing for Clean Air Day 2023 coordinated by Cumberland Council which will be reported in the following reporting year.

Image 3: An image presenting some participants in the Clean Air Day 2022 Community Clean Up.

Image 3: An image of Clean Air Day Awareness at Keswick Area Office

Image 4: An image advertising the Safe Parking Pledge 'Design a postcard competition' amongst local schools.

In 2019, Cumbria County Council engaged with PodPoint to commission a feasibility study, to assess the business case for installing electric vehicle charge points ('EVCPs') at five Council-owned sites in strategic locations across the County. 2 new sites across the Allerdale Borough Council area at main Transport Hubs were identified and were installed in Maryport and Workington Train Station during 2022. This project is intended to contribute to the long term facilitation of the anticipated societal move away from vehicles powered by fossil fuels to vehicles using renewable sources of energy. This trend will have positive effects on local environments and specifically air quality, by reducing vehicle emissions, leading to public health benefits.

Image 5: An image of the electric vehicle charge points at Maryport Train Station

Image 6: An image of the electric vehicle charge points at Workington Train Station

Conclusions and Priorities

Overall, the results from 2022 demonstrate that NO_2 annual mean concentrations within Allerdale Borough Council still remain significantly reduced at the majority of monitoring sites when compared to 2019 results from to the impact of the COVID-19 pandemic during 2020/21.

In comparison to monitoring locations within 2019/20, in 2022, 9 of these monitoring locations reported continued reductions in Nitrogen Dioxide levels during 2022 with DT3/3B Crown Street, Cockermouth reporting the greatest reduction of 1.7 µg/m^3. Whereas 6 of the monitoring locations from 2019/20 reported a marginal increase in Nitrogen Dioxide levels however not representative to 2019 figures pre the COVID-19 pandemic. With sites DT8/8B and DT14/14B demonstrating some stability in the results. With DT5/5B Curzon Street, Maryport reported the highest increase of Nitrogen Dioxide levels of 0.9 µg/m^3 in 2022 yet, still under pre COVID-19 figures in 2019. Due to annualisation requirements, for DT12/12B in 2022 these results have not been included in this overview.

For 2022, DT6/6B Ramsay Brow, Workington recorded the highest Nitrogen Dioxide level reading of 22.9 µg/m^3 (a 0.6 µg/m^3 increase from 2021) and DT13/13B Strawberry How Road, Cockermouth reporting the lowest Nitrogen Dioxide level of 4.1 µg/m^3 a 0.8 µg/m^3 decrease from the previous reporting year. All results remain well below the national objectives of 40 µg/m^3 and no exceedances of the annual mean Nitrogen Dioxide Air Quality Objective were identified with no Air Quality Management Area(s) needing to be declared during 2022.

In general, Allerdale Borough Council has very good air quality as demonstrated from the monitoring within this Annual Status Report. Allerdale Borough Council continue to proactively manage potential air quality impacts from major developments both individually and collectively. With detailed air quality assessments required from developments via the planning process when necessary. Allerdale Borough Council are committed to maintaining and improving the air quality within this region with relevant stakeholders and will continue to do so as part of Cumberland Council from April 2023 onwards. Whereby the aim of Cumberland Council is to improve the health and wellbeing of Cumberland residents.

Local Engagement and How to get Involved

Air pollution is a local issue and comes from many sources, it has local health impacts and can be tackled by local action. From social media communication and public engagement events it appears the level of interest is growing.

As a resident of Allerdale Borough Council (Cumberland Council) you can help make a positive difference to improve your air quality:

• Where possible consider public transport, walking, car sharing, or cycling to reduce emissions rather use your vehicle for short trips. The Visit Allerdale webpage having worked with Sustrans contains a collection of various cycle and walking routes across this region: https://visitallerdale.co.uk/thingsto-do/road-cycling-routes-in-allerdale/.

• Use Traveline and Cumbria Journey Planner to explore your transport options. Make the most of Park and ride facilities in Cockermouth if travelling to Buttermere Valley within the Lake District from the West Coast. A shuttlebus was available in 2022 and is available during the Summer of 2023: Minibus tours and bus explorer tickets : Lake District National Park.

• Sign up to use the Community Wheels Scheme, a community transport scheme co-ordinated by Cumbria County Council (Cumberland Council) in February 2023 to provide transport solutions to those not served by regular bus routes within Caldbeck. The minibus is also available for group hire through Cumbria Community Transport: Community Wheels launches between Caldbeck, Wigton and Carlisle (cumbria.gov.uk).

• If purchasing a car, consider an electric vehicle or a vehicle with the lowest exhaust emissions and the electronic car grants available: Low-emission vehicles eligible for a plug-in grant - GOV.UK (www.gov.uk). Details of available electrical vehicle charging points are available online and are to be made available on our webpages.

• Service your vehicle regularly so it runs efficiently and saves you fuel costs. By checking your tyre pressure will improve your fuel consumption. In addition drive economically and within the speed limit, as emissions can rise at increased speeds. You can report a smoky vehicle to: Report a smoky lorry or bus - GOV.UK (www.gov.uk).

• If installing or replacing an existing wood burning stove consider purchasing a stove that is approved for use in an Allerdale Smoke Control Area or an EcoDesign Ready Stove by visiting: https://www.allerdale.gov.uk/en/yourenvironment/smoke/.

• More information on the Woodsure certification scheme and where you can find local suppliers are available here: https://woodsure.co.uk/.

• Make clean air decisions in your home. From air purifying plants, ventilation, only burning dry-well seasoned or smokeless fuel, chose low volatile organic compounds and fragrance free cleaning products.

• After following the guidance, consider reporting a smoke nuisance related issue or Smoke Control Area alleged breach: Smoke nuisance (allerdale.gov.uk)

• Partake in public consultations regarding developments within Cumberland.

• To learn more information about the facts on air quality: https://www.cleanairhub.org.uk/clean-air-information.

• For further information about air quality in Cumberland (Allerdale region) visit: https://www.allerdale.gov.uk/en/your-environment/air-quality/.

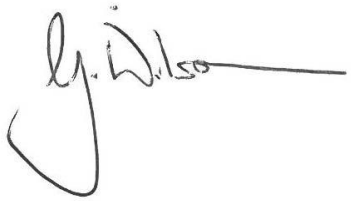
• Businesses, Education establishments and communities interested in future Clean Air Day events please contact us to register your future interest: environmental.health@cumberland.gov.uk

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Allerdale Borough Council now part of Cumberland Council with the support and agreement of the following officers and departments:

- Cumberland Council Environmental Health Department (Allerdale region)
- Cumberland Council Planning Department (Allerdale region)
- Cumberland Council Highways Department (Allerdale region)
- Cumberland Council Human Resources Department
- Allerdale Waste Services (Tivoli)
- Cumberland Council Licensing Department (Allerdale region)
- Cumberland Council Housing Services Department (Allerdale region)
- Cumberland Council Destinations Department (Allerdale region)

This ASR has been approved and signed off by the Assistant Director of Public Health and Protection.



Mr Graeme Wilson, Assistant Director of Public Health and Protection at Cumberland Council

If you have any comments on this ASR please send them to Environmental Health (Allerdale region) at: environmental.health@cumberland.gov.uk

Environmental Health Department. Public Health and Protection, Cumberland Council, Allerdale House, Workington, Cumbria, CA14 3YJ

Telephone: 0300 373 3730

Email: environmental.health@cumberland.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in Allerdale Borough Council during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Allerdale Borough Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

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 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

Allerdale Borough Council does not have any declared AQMAs. A local Air Quality Strategy is under revision and consideration during the local government reorganisation phase to prevent and reduce polluting activities. The Local Air Quality Strategy is available within the Cumbria Joint Public Health Strategy available at: https://www.cumbria.gov.uk/elibrary/content/internet/535/7022/4384612134.pdf

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2.2 Progress and Impact of Measures to address Air Quality in the Allerdale Borough Council area

Defra's appraisal of last year's ASR concluded

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:

1. The ASR confirms that the Allerdale Borough Council continues to experience no AQO exceedances and so, no AQMAs are required.

2. Current monitoring trends from 2017 to 2021 are presented clearly in Figure A.1 and discussed extensively in the Executive Summary and on a site-by-site basis in the main body of the ASR, a small addition of the overall trends for the borough could be added to the main body of the ASR.

3. The mapping showing diffusion tube monitoring site locations is comprehensive and clearly shows the passive NO_2 monitoring network within the borough.

4. QA/QC procedures appear to have been correctly applied for diffusion tube monitoring sites, however ideally commentary would be provided to justify the use of the national bias adjustment factor as well as the AIR-PT results for SOCOTEC.

5. Ensure that the text is read thoroughly to remove references that are no longer required such as Table A.5 in Section 3.2.1.

6. Allerdale Borough Council provides a lot of detail throughout the ASR, in particular in the following sections: Actions to Improve Air Quality, Local Engagement and How to get Involved, $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations and Individual Site Data for Nitrogen Dioxide.

Allerdale Borough Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. Such measures are included within Table 2.1, with the type of measure and the progress Allerdale Borough Council have made during the reporting year of 2022 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.

Key completed measures are:

- Maintained the air quality monitoring programme to allow for analysis of trends and reviewing any behavioural changed associated with the COVID-19 measures from 2020/21. It is intended revisions will be made for the 2023 air quality monitoring programme.
- Delivery of a successful Clean Air Day 2022
- Continued engagement with public health professionals via Air Quality and Public Health events focussing on reducing deaths and ill health attributed by poor air quality in Cumbria and Lancashire. Including Port Authorities with air quality monitoring near the Ports of Silloth and Workington.
- Installation of Electrical Vehicle Charging Points in Maryport and Workington Transport Hubs.
- A Climate motion was agreed to make Allerdale Carbon Neutral by 2030 if possible. A cross-party Climate Change Task and Finish Group was set up. Work has started to establish a Climate Change Group to update Allerdale Borough Council's Climate Change Strategy and Action Plan which will now progress forward as part of Cumberland Council.

Allerdale Borough Council expects the following measures to be completed over the course of the next reporting year:

- Relocation of monitoring sites at Kirkby Street, Maryport and Strawberry How, Cockermouth
- A new Air Quality Strategy for Cumberland Council and update to Smoke Control Area Policy from new guidance published in 2022.
- Continue to work to educate and push the principles of reducing public exposure to air pollution, domestic burning ($PM_{2.5}$) indoor air quality in line with the 2019 Clean Air Strategy. This will include events, media communications and to explore opportunities within an educational setting.
- Continue to support communities and Town Councils to increase awareness and display air quality information in relation to the 2019 Clean Air Strategy and the Environmental Act 2021.

- The Environmental Health Department will continue to work with Planning Authorities and Developers with regard to new developments or national infrastructure projects focussing on air quality implications of such developments.
- Assess agricultural developments via the planning process with regards to ammonia emissions.
- The Environmental Health Department will continue to regulate and monitor combustion plant emission sources such as: Combined Heat Power Plants, Biomass Boilers and Diesel STOR Generator Plants via the planning process.

Allerdale Borough Council's priorities for the coming year are:

- Local government reorganisation to Cumberland Council and working with partners on an Air Quality Strategy and Smoke Control Area Policy for the new unitary authority.
- Review of monitoring and background monitoring locations for changes in 2023/24 subject to review of data followed by requests and partnership working.
- Deliver a successful Clean Air Day 2023 working with partners within the new Cumberland Council and local businesses. In order to encourage positive behavioural changes and lessons being learned, regarding collective action and the impact on air quality on our health.
- Allerdale Borough Council recognises the risks from air pollution on communities that face the greatest risks from the wider social and behavioural determinants of health (The Public Health Foundation, 2020). Allerdale Borough Council intends to continue to take a multi-agency approach with partners, working on community engagement projects to improve health outcomes as part of Cumberland Council.
- Continue to work towards the agreed Climate Change Motion via the Climate Change Group to review and update the Climate Change Strategy and Action Plan as part of the wider Cumberland Council.
- Support air quality education within specific schools working with partner agencies.
- Explore grant funding options to enable the extension of the number of pollutants monitored working with partnering organisations as part of the wider Cumberland Council.

- Continue to act on the 2019 Clean Air Strategy and any changes to air quality legislation with respect to the Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020 and Environmental Act 2021 amendments to the Clean Air Act 1993. As well as the Environmental Improvement Plan published in 2023 and subsequent Environmental Targets (Fine Particulate Matter) (England) Regulations 2023.
- As well as look to support any future consultations on a new system to update standards for smaller industries that fall under Part B processes. Including partake in any consultations in extending environmental permitting regulations to dairy and intensive beef farmers given the rural nature of our area.
- Allerdale Borough Council will look to support the delivery of a Clean Maritime Plan with the Department of Transport. Including any consultations on the extension proposals to the existing North Seas Emission Control Area to the nearby Irish Sea for this area.

Allerdale Borough Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Neighbouring local authorities
- Cumbria County Council Highways Department and Highways England
- Local Government Departments

The principal challenges and barriers to implementation that Allerdale Borough Council anticipates facing are:

- Allerdale Borough Council is a two-tier Borough Council with County Council, however we continue to work together to improve air quality within Allerdale. With future local government reorganisation plans scheduled for a new Unitary Authority by April 2023. This was delivered on the 1st April 2023.
- Maximising the effective use of resources available including Officer Time and funding.
- Funding challenges regarding key national infrastructure projects some of which some are now either aborted or in discussion.

- Funding to enable the extension of the number of pollutants monitored within the Allerdale region. Households with no car/vans across Cumbria is at 21% in comparison to national average (Cumbria Observatory 2011). This figure implies that there is a high percentage of car ownership. Bus and rail links are adequate although evening and Sunday services can be limited (Cumbria Community Foundation 2019).

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

- Work in rural communities to influence behaviour on domestic burning due to Officer Time and funding.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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	Annual Review of air sampling points for Nitrogen Dioxide	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2022	Local Authority Environmental Health, Local Authority Transport Dept.	Local Authority	NO	Not Funded		Implementation	See ASR Reporting Documents	Evidence based via sampling programme and modifications	Implementation ongoing	Under continuous review
2	Local Authority Environmental Health to work with Planning Authorities with regard to new development considering air quality implications	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2022	Local Authority Environmental Health, Local Authority Transport Dept. Local Authority Planning.	Local Authority organisations	NO	Partially Funded		Implementation		Planning consultations completed within the consultation period	Environmental Health are consulted at pre-planning stage on all proposed developments which may impact on air quality. Via the planning process Allerdale has been pro-active in ensuring the borough maintains its low levels of pollution. Air quality assessments have been required for developments including potentially polluting industrial applications. Industrial applications, combined heat and power systems or other combustion method energy production such as gas turbine or biomass boilers.	Funding
3	Reducing levels of PM 2.5	Public Information	Via other mechanisms	2021	2022	Local Authority Environmental Health, Local Authority Transport	N/A	NO	Partially Funded		Implementation				Implementation ongoing

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
						Dept, Planning Authorities.									
4	Reducing ammonia emissions from farming	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	2022	Defra, Natural England and other organisations	UK Government	YES	Partially Funded		Implementation	Ammonia and secondary PM2.5 emissions	Individual merit and individual applications received working Catchment Sensitive Farming (CSF).	A number of enclosure applications have been received via the Allerdale Planning department due to the incentives offered by Natural England. Natural England are also consulted on any new applications to assist in incorporating best practice design and operation. Investigation of odour complaints will help identify poor practice of spreading. Close working with Environment Agency and United Utilities in relation to the spreading of sewage sludge and operation of Permitted Agricultural activities.	
5	National Infrastructure projects	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2022	United Utilities	United Utilities	NO			Completed			Project completed in 2022.	
6	Major development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014		West Cumbria Mining Project and partner organisations	West Cumbria Mining Project and partner organisations	NO			Planning			A project to build the world's first net-zero mine to supply a new domestic source of	

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
														metallurgical coal for Britain and Europe's steelmakers nearby.	
7	National Infrastructure projects	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021		Small Modular Nuclear Reactor Project Considerations	Small Modular Nuclear Reactor Project Considerations	NO			Planning			Partners in Cumbria have been working closely with Rolls-Royce to help it to progress its plans to bring Small Modular Reactors (SMRs) into use to support clean energy generation:	Plans are ongoing
8	National Infrastructure projects	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021		Allerdale Community Partnership (Geological Disposal Facility)	Allerdale Community Partnership (Geological Disposal Facility)	NO			Planning			Due to the area's nuclear heritage, an Allerdale geological disposal facility community group has been established to reconsider the future of nuclear waste and its storage.	Consultation ongoing
9	Allerdale Borough Council to continue annually with statutory duties in connection to Part A2 Part B environmental permit processes.	Environmental Permits	Introduction/increase of environment charges through permit systems and economic instruments	2021	2022	Allerdale Borough Council	Allerdale Borough Council	NO	Funded		Implementation			Risk based approach due to statutory guidance.	Implementation on-going. Allerdale Borough Council regulated permits for 35 Part B and 3 A2 processes. No enforcement action was required during 2022 and no unexpected air pollution incidents have been recorded

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
10	Local Policy Section 19 - Renewable Energy and Low Carbon Technologies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	2029	Allerdale Borough Council	Allerdale Borough Council	NO			Implementation		In order to achieve national renewable energy targets Allerdale Borough Council supports the development of new sources of renewable energy on the understanding measures taken avoid significant impacts on the local amenity.	Local Plans are to be incorporated within the wider Cumberland Council Local Plan. For this specific area of the future Cumberland Council Local Authority area it is anticipated that this will continue.	Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 adopted in 2020 identifies or 'allocates' land to deliver the strategy and contains additional supporting policies to guide development.
11	Adopted local policy section 22 - Sustainable Travel Choices	Transport Planning and Infrastructure	Other	2014	2029	Allerdale Borough Council	Allerdale Borough Council	NO			Implementation		Key objective of spatial planning is to ensure that jobs, housing, shopping, leisure and services are accessible by public transport, walking and cycling. ALPP1, Transport Principles, requires, where appropriate the incorporation of charging points for electric and hybrid vehicles.	Local Plans are to be incorporated within the wider Cumberland Council Local Plan. For this specific area of the future Cumberland Council Local Authority area it is anticipated that this will continue.	

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12	Adopted Local Policy Section 21 - Developer Contribution	Policy Guidance and Development Control	Other policy	2014	2029	Allerdale Borough Council	Allerdale Borough Council	NO			Implementation		Community Infrastructure Levy (CIL) is being explored as a levy that the Council may use to charge on new developments. This ensures that without compromising development viability. Contributions will provide necessary enhancements including energy initiatives and climate change solutions with regards to air quality	Local Plans are to be incorporated within the wider Cumberland Council Local Plan. For this specific area of the future Cumberland Council Local Authority area it is anticipated that this will continue.	Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 adopted in 2020 identifies or 'allocates' land to deliver the strategy and contains additional supporting policies to guide development.
13	Adopted Local Policy Section 36 - Air, Water and Soil Quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	2029	Allerdale Borough Council	Allerdale Borough Council	NO			Implementation		The policy sets out the council's approach to ensuring that air and water quality are protected and enhanced and soil quality is maintained and not eroded.	Local Plans are to be incorporated within the wider Cumberland Council Local Plan. For this specific area of the future Cumberland Council Local Authority area it is anticipated that this will continue.	Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 adopted in 2020 identifies or 'allocates' land to deliver the strategy and contains additional supporting policies to guide development.

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14	Cycle to work	Promoting Travel Alternatives	Promotion of cycling	2017		Allerdale Borough Council	Allerdale Borough Council	NO			Implementation		Active in house travel plan. Tax free bike scheme to help employees save money on a new bike and bike safety equipment.		This scheme is currently in place whilst the Council has agreed the hybrid working model. This scheme is due to be reviewed given hybrid working and local government reorganisation.
15	Allerdale Waste Services Contract	Policy Guidance and Development Control	Sustainable Procurement Guidance	2020		Allerdale Waste Services (Allerdale Borough Council and Tivoli)	Allerdale Waste Services (Allerdale Borough Council and Tivoli)	NO			Implementation		Within the following years Tivoli aim to achieve their goal of using more battery powered handheld equipment. By reviewing collection rounds to make them more efficient in 2022 Further work on refinement continues in 2023.		
16	Statutory duty of investigation of dark smoke and smoke nuisance and managing smoke control areas. When necessary, enforcement action is taken in accordance with enforcement policy.	Public Information	Other	2021	2022	Local Authority Environmental Health	Local Authority Environmental Health	NO			Implementation	Figures for 2021-2022 have remained relatively stable	Number of smoke nuisance complaints received to the Department.	Engagement through Officer Visits and social media channels. With future revisions given to Smoke Control Area Policy.	

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17	Allerdale Development Management Policy 6 - Equestrian and Agricultural Buildings	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	2029	Allerdale Borough Council	Allerdale Borough Council	NO			Implementation		This policy sets that proposals for stables, equestrian activities and agricultural buildings in the countryside will be permitted provided meting specific criteria with no significant adverse effect on air quality/emissions.		Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 adopted in 2020 identifies or 'allocates' land to deliver the strategy and contains additional supporting policies to guide development.
18	Review of traffic restrictions in Allerdale area as part of the Cumbria Transport Plan Strategy 2011 - 2026	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2012	2026	Highways Authority	Highways Authority	NO			Implementation			Ongoing	A variety of parking and traffic restrictions in Allerdale and have been reviewed and introduced since measures taken in previous reporting years.
19	Air Quality Bids for funding	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2022	Allerdale Borough Council and Defra	Allerdale Borough Council and Defra	NO						Under review	
20	Major development levelling up bid for Workington Gateway Project	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021		Allerdale Borough Council	Allerdale Borough Council	NO			Implementation			Confirmation of funding is to be released in 2023 and will be reported further in future reporting years.	
21	Allerdale Borough Council Events Policy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020		Allerdale Borough Council	Allerdale Borough Council	NO			Implementation		Encourages the continuous improvement in promoting events more sustainably	Ongoing	

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22	Green Home Grants - LAD2, Sustainable Warmth and HUG1 Schemes	Other	Other	2021		Allerdale Borough Council Housing Services and partners	Allerdale Borough Council Housing Services and partners	NO	Funded		Implementation		Number of applicants. 2022 estimated figures indicate that 264 LAD properties completed & 47 HUG1 properties completed during 2022.	Ongoing	A government energy efficiency scheme in Great Britain to help reduce carbon emissions and tackle fuel poverty. In light of recent movements regarding climate change, indoor air quality and focuses on PM 2.5. The following information has therefore been included in this report as positive and relevant.
23	Implementation of the Air Quality (Taxi and Private Hire Vehicles Database) Regulations 2019	Policy Guidance and Development Control	Other policy	2019		Allerdale Borough Council Licensing Authority	Allerdale Borough Council Licensing Authority	NO	Funded		Implementation		Number of entries made	Ongoing	To support the UK Plan for tackling roadside nitrogen dioxide concentrations and the development of Clean Air Zones
24	Penrith to Keswick Rail Link and looking at ways to move forward plans to reinstate the Silloth to Carlisle Railway	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2020		Department of Transport	Department of Transport							Ongoing	Air Quality Bid by Cumbrian MPs to Department of Transport Ideas Fund to improve provision of public transport across Cumbria including areas in Allerdale

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	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
25	Major Development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2026	West Cumbria Community Forest. Defra, Forestry Commission, Cumbria Woodlands, and Local Authorities	West Cumbria Community Forest. Defra, Forestry Commission, Cumbria Woodlands, and Local Authorities	NO	Funded		Planning			Ongoing	Up to 150 hectares of trees, woodlands and forests will be planted, with the equivalent of one tree planted for every resident in Copeland, Barrow and Allerdale. This announcement forms part of the Government's wider action to recover and restore nature, as part of the 25 Year Environment Plan and commitments to reach net zero by 2050.
26	Promotion of local initiatives	Public Information	Other	2019		Allerdale Borough Council, Global Action Plan: Clean Air Day and partners	Allerdale Borough Council, Global Action Plan: Clean Air Day and partners				Implementation		Number of promotions, education and engagement	Ongoing	Clean Air Day 2022 took place with plans for Clean Air Day are underway for June 2023 and beyond.
27	Implementation of the Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021		Local Authority Trading Standards	Local Authority Trading Standards				Implementation		Engagement and enforcement	Ongoing	These regulations cover the banning of polluting wet wood and house coal in England. These regulations introduce a Ready to Burn certification scheme and logo. In order to make a difference to the environmentally responsible use of solid fuels and wood for stoves and boilers.

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28	Allerdale Borough Council's Procurement Strategy 2020 - 2030	Policy Guidance and Development Control	Sustainable Procurement Guidance	2020	2030	Allerdale Borough Council and other Local Authorities through Effective Procurement in Cumbria	Allerdale Borough Council and other Local Authorities through Effective Procurement in Cumbria				Implementation		Sustainable Procurement Practices	Ongoing. Such strategy are to be incorporated within the wider Cumberland Council.	
29	Building Control Regulations	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2022		Local Authority Building Control	Local Authority Building Control				Implementation		Engagement and enforcement	Infrastructure for electric vehicles - Approved Document S applies to new residential and non-residential buildings; buildings undergoing a material change of use to dwellings; residential and non-residential buildings undergoing major renovation; and mixed-use buildings that are either new, or undergoing major renovation. Including Approved Document F describes how ventilation systems should be designed to minimise the intake of external air pollutants.	

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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.

Allerdale Borough Council recognises the impacts of $PM_{2.5}$ on the health and wellbeing of residents and environment. United Kingdom Health Security Agency (UKHSA) have stated in their statistics that the annual concentration of fine particulate matter ($PM_{2.5}$) exposure to population in the Allerdale District is the lowest in the North West of England. With the average fine particulate matter ($PM_{2.5}$) exposure in Allerdale measured at the new method – concentrations of total PM2.5 at a value 4.2 µg/m^3 in 2021 (Public Health Outcomes Framework, 2021). In comparison to the North West England region value of 7.1 µg/m^3 and the England value of 7.4 µg/m^3 making Allerdale in the best quintile for England.

With the absence of $PM_{2.5}$ and PM_{10} in Allerdale, monitoring data was taken from the current 2018 Defra background mapping resource to provide maximum annual mean $PM_{2.5}$ concentration for Allerdale Borough Council in 2022. This exercise identified an annual mean concentration of 5.98 µg/m^3 at the coordinates of: X (Easting) 300500 Y (Northing) 528500. This calculated mean concentration is well below the upcoming legal target of 10 µg/m^3 by 2040 and 2028 target of 12 µg/m^3 introduced by the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. The coordinates for this are taken from within a 1 km grid square and this coordinate is a centroid of that location and is in close proximity to monitoring stations DT1/1B, DT2/2B and DT6/6B for NO_2. However, this 2022 projection is taken from the 2018 reference year and tools are formed on assumptions taken before the COVID-19 outbreak in the UK. Therefore, these tools do not reflect any of the implications on emissions in 2020/21 from any national or local lockdown restrictions.

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

• Allerdale Borough Council continues to operate for 2022 and will operate as part of Cumberland Council in 2023 taking control of the services previously provided by Allerdale Borough Council and neighbouring local authorities.

• Allerdale Borough Council will regulate and enforce Smoke Control Areas and our duties under the Clean Air Act 1993 and Environmental Protection Act 2021, please see Appendix D for a defined mapped areas. With the introduction of a new and revised Smoke Control Policy is undergoing review.

• Educational information continues to be distributed via social media and promotional events across the region. In an attempt to change domestic burning behaviours and fuel used by those reliant solid fuels.

• Allerdale Borough Council will continue to work with its duties under the Housing Act 2004 and subsequent housing enforcement legislation to address exposure to $PM_{2.5}$.

• Allerdale Borough Council will continue with its duties under the Environmental Permitting Regulations 2016 to regulate and control in regards to emissions from all Part A2 and Part B Processes located within the Allerdale local authority area. This includes continue to support Businesses with the UK BAT regime so industries use up to date technology to reduce emissions.

• Allerdale Borough Council will continue to work with developers with the planning and implementation of major developments which may impact air quality in Allerdale.

• Allerdale Borough Council will continue to deliver the ventilation requirements issued by the Department of Levelling Up, Housing and Communities (DLUHC) to maintain indoor air quality as part of the amendments to the Building Regulations 2010 which took effect in June 2022.

• Allerdale Borough Council continue to regulate and monitor combustion emission sources such as Combined Heat Power Plants, Biomass boilers and Diesel STOR Generator Plants through the planning process.

• Allerdale Borough Council will continue to support partners in monitor intensive farming practices working with partners via the Environment Agency and the planning process. Allerdale Borough Council recognises the rural nature of this region and the association between ammonia and secondary $PM_{2.5}$ and grants available via Defra to support

investment of low emission equipment via Countryside Stewardship Schemes, Farm Equipment and Technology Funds.

• Allerdale Borough Council will consult with Natural England and Environmental Health via the Development Planning process to reduce emissions for new agricultural activities in the area.

• Allerdale Borough Council continues to review its environmental impact of Council functions via establishing and reviewing its Travel Hierarchy, Home Working (Hybrid) Policy, Electric Car Share Policy and environmental services contracts with Tivoli and Allerdale Waste Services.

• Allerdale Borough Council continues to work with the Climate Change Group to review and update the Climate Change Strategy and Action Plan.

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

This section sets out the monitoring undertaken within 2022 by Allerdale Borough Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Non-Automatic Monitoring Sites

Allerdale Borough Council undertook non- automatic (i.e. passive) monitoring of NO_2 at 18 sites during 2022. 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.

Changes during the reporting year (2022) included:

Reinstallation of DT12/12B Northside Primary School

Renovation works on the façade of this school building at this monitoring station created accessibility challenges in 2022. This reinstallation was taken when accessibility challenges had improved to support Allerdale's approach to monitoring and work within the local community.

Monitoring during the reporting year (2022) included:

Allerdale Borough Council takes a proactive approach towards the review of their air quality monitoring programme. Yet due to the monitoring changes required during 2021 and COVID-19 measures in place, Allerdale Borough Council decided to maintain its locations within the monitoring network for 2022. This has been completed and was intended to

analyse trends and review any behavioural changes associated with the COVID-19 pandemic measures from 2020/21.

Planned changes for 2023 monitoring:

Cumberland Council (Allerdale Borough Council) will continue to review monitoring options for the 2023/24 reporting year subject to future requests and partnership working. In April 2023, Cumberland Council will take over the services provided originally by Allerdale Borough Council, Carlisle City Council, Copeland Borough Council and Cumbria County Council. Diffusion tubes are located at the worst case receptor, and from analysis of 2021/22 results some changes to the monitoring network will be introduced:

Relocation of DT13/13B Strawberry How, Cockermouth to Marvejols Park, Cockermouth

A relocation of this suburban monitoring station to a similar suburban location towards Marvejols Park onto Cumbria County Council (Cumberland Council) asset in accordance with TG22 is anticipated to take place in 2023. This action will be taken due to a review of the data provided in 2021/22 and the Council's approach to demonstrate worst case receptor and encourage greater representation of data.

Relocation of DT14/14B Kirkby Street, Maryport to Eaglesfield Street, Maryport

The relocation of this recent urban background monitoring station a short distance towards Eaglesfield Street onto Cumbria County Council (Cumberland Council) road sign in accordance with TG22 is anticipated to take place in 2023. This action will be taken due to a review of the data provided in 2021/22 and data gaps along with the Council's approach to a proactive air quality monitoring programme.

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_2)

Error! Reference source not found. and Table A.2 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. 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 2022 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.

The full 2022 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. Mapped air quality locations are presented in Appendix D. In Table A.2 there are no exceedances of the lower annual objective for Nitrogen Dioxide of 40µg/m^3 at any of the 18 monitoring sites during 2022. As sites are situated for worst case scenario in close proximity to the pollutant source (road traffic). To date, there is no evidence that supports the declaration of an Air Quality Management Area. Figure A.1 – shows trends in Annual Mean NO_2 Concentrations from 2018-2022. The 2018 Annual Screening Report published a review of sampling locations to ensure monitoring is carried out in areas where concentrations are expected to be the highest and where the public (receptors) may be exposed to over the averaging period of the objectives.

Following Local Air Quality Management guidance it has been advised that there is no need to demonstrate modelling of pollutant dispersal and distance correction to the nearest receptor. This is due to the results being well below the national objectives and outside of the threshold recommendations outlined by TG22 in paragraph 7.84 (annual mean above 40 µg/m^3). There are no annual means greater than 60µg/m^3 (highest recorded 2022 raw mean of 30.1 µg/m^3), demonstrating compliance with TG22 that an exceedance of the 1-

hour mean 200 µg/m^3 objective not to be exceeded more than 18 times a year is very unlikely to be reached at any of the air quality monitoring sites.

Individual site data:

DT1/1B Hall Park View, Workington

This monitoring point is located at a road improvement site for any future infrastructure development. Diffusion tubes are placed at the possible worst case receptor on Hall Park View, Workington. 12 months of diffusion tube data was collected with 12 months being duplicate data, indicating good precision. For 2022, the data demonstrated an annual bias adjusted mean of 11.6 µg/m^3 a decrease from 2021 by 1.5 µg/m^3 at 13.1 µg/m^3. Since COVID-19 measures of 2020/21, in 2022 post lockdown restrictions results have continued to fall at this location, by 4.6 µg/m^3 compared to pre COVID-19 measures with 16.2 µg/m^3 reported during the 2019 reporting year.

DT2/2B Murray Road, Workington

This urban centre monitoring location is on the façade of a building facing Murray Road close to the Workington Bus Station, a major bus station hub in Allerdale and the wider Cumbria community. Murray Road, is a High Street in Workington with a one way carriageway predominantly occupied by parking, loading and taxi ranks. 12 months of diffusion tubes were collected with 11 months being duplicate tube data, the annual bias adjusted mean recorded was 22 µg/m^3 an increase of 0.2 µg/m^3 from 2021 data. This result is the second highest Nitrogen Dioxide annual mean concentration in Allerdale for 2022. Results are gradually increasing at this location, however is a 3 µg/m^3 reduction in 2019 pre-COVID-19 measures were in place; indicating a significant reduction in Nitrogen Dioxide annual mean concentration at this site.

DT3/3B Crown Street, Cockermouth

12 months of diffusion tube data were collected with 12 months being duplicate data, indicating good precision and continued to provide improvements in data collection from

incidents pre-2020. For 2022 the annual bias adjustment for this location was 15.2μg/m^3, a decrease of 1.7μg/m^3 from 2021 data. Results at this location do not follow the trend of a steady return to pre COVID-19 levels back in 2019, with a results difference reduction of 4.6μg/m^3 from 2019 results.

DT4/4B Main Street, Keswick

This roadside location in close proximity to a Guest House at the B5289-A5272 roundabout has been prone to substantial queueing to Lake District locations such as Derwent Water and the Borrowdale Valley. 12 months of diffusion tube data was collected with 12 months being duplicate tube data. The 2022 annual bias adjustment recorded a nitrogen dioxide annual mean concentration of 21.6μg/m^3 increase of 0.5 μg/m^3 and is again the third highest result in Allerdale for 2022 as it was in 2021. Results for this location remain significantly lower than 2019 levels and there now remains a 3.9μg/m^3 from 2019 levels.

DT5/5B Curzon Street, Maryport

This kerbside location is situated to a four-way traffic light-controlled box junction and demonstrates worst case. 12 months of diffusion tube data was gained for this location including 12 months of duplicate data indicating good precision. The 2022 annual bias adjustment mean results in a nitrogen dioxide mean concentration of 20μg/m^3 an increase of 0.9 μg/m^3. This has the fourth highest reading for the Allerdale region and in comparison to previous monitoring years, the data shows a reduction of 3.9μg/m^3 from 2019. As COVID-19 restrictions varied during 2020/21, a steady reduction of the Nitrogen Dioxide annual mean concentrations have occurred at this site since the COVID-19 pandemic.

DT6/6B Ramsay Brow, Workington

This kerbside location is located at a receptor façade along the A66 in close proximity to the traffic lights controlled at the A596 junction. These are 2 major roads within West Cumbria and a bottleneck at Ramsay Brow is a common occurrence. 12 months of diffusion tube data was collected for this location with 12 months of duplicate data. This is again the highest overall Nitrogen Dioxide annual mean concentration in Allerdale as was in 2020/21 with 22.9 μg/m^3 for 2022 an increase of 0.6μg/m^3 from 2021. The result for 2022 remains significantly less to pre COVID-19 levels with a result of 28.5 μg/m^3 reported in 2019.

DT7/7B King Street, Wigton

This is the longest monitoring location for Allerdale situated on a High Street in Wigton since monitoring began in 1993. For 2022, 12 months of diffusion tube data was collected with 12 months of duplicate data. The data for 2022 provided an annual bias adjusted mean of 19.3 $\mu g/m^3$ a 0.7$\mu g/m^3$ reduction from 2021 data and is the fifth highest reading for 2022.

DT8/8B Main Road, Harrington

This kerbside location is at a receptor façade along the A597 and is the most southerly air quality monitoring points within the Allerdale region. Working with Cumbria County Council Highways Authority and Allerdale Borough Council Planning Department indicates a need to continue to monitor at this location. 12 months of diffusion tube data was collected with 12 months of duplicate data, indicating good precision. Road works and changes in road layout have occurred at this site and continue to occur during 2022/23. The data for 2022 demonstrated an annual bias adjustment mean of 12.5 $\mu g/m^3$ indicating a stabilisation to 2021 data and a 3.7$\mu g/m^3$ reduction compared to 2019 data (pre COVID-19).

DT9/9B Lawson Street, Aspatria

This kerbside location at a receptor façade along the A596 was selected due to community requests regarding an increase in HGV activity.12 months of diffusion tube data was collected with 12 months of duplicate data, indicating good precision. For 2022 the annual adjusted mean recorded was 12.5$\mu g/m^3$ a reduction of 0.4$\mu g/m^3$. Compared to 2021, follows a steady reduction during 2020/21; results in 2022 still remain significantly less compared to pre COVID-19 levels with 16$\mu g/m^3$ reported in 2019.

DT10/10B South Street, Cockermouth

This kerbside location at South Street next to Station Street is in close proximity to residential and commercial properties. This location is located at the junction towards the B5292 and

A5086 may provide higher levels from queueing vehicles towards residential receptors when assessed with TG22. 12 months of diffusion tube data was collected with 11 months of duplicate data, indicating good precision. The annual bias adjustment recorded a nitrogen dioxide of an annual mean concentration in 2022 of 12.5 μg/m^3 and is a 0.8μg/m^3 increase compared to 2021 reported levels.

DT11/11B Penrith Road, Keswick

This monitoring location is situated close to a Guest House along a main A591 and A5271 junction. 12 months of diffusion tube data was collected with 11 months of duplicate data. The data for 2022 resulted in an annual bias adjustment mean of 14.1 μg/m^3 a decrease of 0.7 μg/m^3 from 2021 data yet still remains a significant reduction of 5.9 μg/m^3 in comparison to 2019 results (pre COVID-19 levels).

DT12/12B Northside Primary School, Northside

This location is situated at the façade of Northside Primary School in accordance with TG22. In addition this site faces the A596 and is in close proximity to Workington Port and a retail park. 6 months of diffusion tube data was collected with 6 months of duplicate data. Site access issues were presented at this site due to renovation work due to the Councils' monitoring programme and Clean Air Strategy this site is a strategic location towards Workington Port. However as part of the proactive monitoring programme the feasibility of alternative similar educational sites are to be considered in future reporting years. The calculated annual bias adjusted mean for 2022 was annualised to 11.8μg/m^3 an 1.9 μg/m^3 increase from 2021 and a 0.4μg/m^3 reduction to 2019 data (pre COVID-19 levels).

DT13/13B Strawberry How Road, Cockermouth

This is a suburban background monitoring location positioned on the outskirts of Cockermouth in accordance with TG22. Based at a Cumbria County Council Lamppost on Strawberry How Road towards Ellermire Drive and the junction near School Gardens in the direction of Strawberry How Nursery School. 12 months of diffusion tube data was collected with 12 months of duplicate data. The annual bias adjusted mean for 2022 was 4.1μg/m^3 a reduction of 0.8 μg/m^3 from 2021 data following an increase of 0.3μg/m^3 from 2020's

annualised figure when the site was introduced. This location remains the lowest Nitrogen Dioxide annual mean concentration in 2022 for the third consecutive year. Due to the Councils' approach to monitoring and worst case scenario a similar suburban area has been selected where this monitoring location will be decommissioned and relocated to another area of Cockermouth.

DT14/14B Kirkby Street, Maryport

This is an urban background monitoring location positioned in accordance with TG22 an urban residential area.12 months of diffusion tube data was collected with 9 months of duplicate data. The annual bias adjusted mean for 2022 was 6.5μg/m^3 a similar result to 2021 where this was an increase of 0.9 μg/m^3 from 2020's annualised result. This location remains the second lowest Nitrogen Dioxide annual mean concentration for Allerdale in 2022 for the consecutive year. Due to the Councils' approach to a proactive monitoring programme and the data collection challenges presented at this site, a similar urban background location has been commissioned for a relocation in 2023.

DT15/15B Eden Street, Silloth

This was a newly relocated monitoring location for 2021 and remains an industrial background monitoring location for 2022/23. This site was successfully repositioned 135m north of the previous Lawn Terrace monitoring location towards the four way junction and B5302. Repositioned to improve representation in accordance with TG22 whereby industrial sources are anticipated to make an important contribution to the total burden on population. 12 months of diffusion tube data was collected with 10 months of duplicate data and is the most northerly monitoring location for Allerdale. The annual bias adjusted mean for 2022 was 7.9μg/m^3 a 0.4μg/m^3 reduction from 2021 results.

DT16/16B Main Road, Seaton

This was a new Kerbside monitoring location for 2021 introduced due to community requests from upcoming housing developments in this area. In accordance to TG22 this site is within 1 metre of the kerb of a busy four way junction towards the local primary school and convenience stores. 12 months of diffusion tube data was collected with 9 months of duplicate data indicating good precision, with a 2022 annual bias adjusted mean of 8.8

μg/m^3, a 0.2μg/m^3 decrease from 2021 results. Due to the Councils' approach to a proactive monitoring programme and the data collection challenges presented at this site, levels will continue to be monitored in 2023 with a feasibility study on the possible relocation will be considered.

DT17/17B South End Street, Wigton

An additional urban background monitoring location was introduced in 2021 and to replace the previous additional monitoring location in Wigton that was decommissioned in 2019. In accordance to TG22, this location is positioned within a residential area away from the urban centre and is broadly representative of urban background conditions and an environmental permitted site. The site faces a four way junction with the residential area of Longthwaite Road and South End Street, opposite a petrol station and Pharmacy. 12 months of diffusion tube data was collected with 12 months of duplicate data, with a bias adjusted mean of 7.2μg/m^3 a 0.9μg/m^3 reduction from 2021 levels. This location is therefore the third lowest Nitrogen Dioxide annual mean concentration for another consecutive year for Allerdale in 2022.

DT18/18B West Street, Aspatria

An additional roadside location was introduced for 2022 in order to increase representation of monitoring for Aspatria. In accordance with TG22, this kerbside monitoring location is within 1-5 metres of the kerb at a busy junction with the B5301 and A596 towards the secondary school. 12 months of diffusion tube data was collected with 12 months of duplicate data, and data collection challenges have improved since 2021. For 2022 a bias adjusted mean of 13.4 μg/m^3 was reported and is the highest reported increase of 1.3 μg/m^3 compared to 2021 levels. This site is the 8th highest Nitrogen Dioxide annual concentration for Allerdale in 2022.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1, DT1B	Hall Park View, Workington	Kerbside	300721	528958	NO2	N/A	0.0	1.0	No	2.5
DT2, DT2B	Murray Road, Workington	Urban Centre	301194	528711	NO2	N/A	N/A	1.0	No	2.5
DT3, DT3B	Crown Street, Cockermouth	Kerbside	311652	530658	NO2	N/A	0.0	0.5	No	2.5
DT4, DT4B	Main Street, Keswick	Roadside	326419	523602	NO2	N/A	4.0	1.5	No	2.5
DT5, DT5B	Curzon Street, Maryport	Kerbside	303778	536534	NO2	N/A	5.0	1.0	No	2.5
DT6, DT6B	Ramsay Brow, Workington	Kerbside	300588	528682	NO2	N/A	0.0	1.0	No	2.5
DT7, DT7B	King Street, Wigton	Kerbside	325508	548419	NO2	N/A	2.0	1.0	No	2.5
DT8, DT8B	Main Road, High Harrington	Roadside	299591	525545	NO2	N/A	0.0	2.0	No	2.5
DT9, DT9B	Lawson Street, Aspatria	Kerbside	315299	542145	NO2	N/A	0.0	1.0	No	2.5
DT10, DT10B	South Street, Cockermouth	Kerbside	312091	530547	NO2	N/A	8.7	0.5	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)
DT11, DT11B	Penrith Road, Keswick	Kerbside	327949	523764	NO2	N/A	7.0	1.0	No	2.5
DT12, DT12B	Northside Primary School, Northside	Kerbside	299939	529709	NO2	N/A	8.0	1.0	No	2.5
DT13, DT13B	Strawberry How Road, Cockermouth	Suburban	313108	529923	NO2	N/A	4.0	0.0	No	2.5
DT14, DT14B	Kirkby Street, Maryport	Urban Background	303671	536648	NO2	N/A	0.0	2.0	No	2.5
DT15, DT15B	Eden Street, Silloth	Industrial	310949	553517	NO2	N/A	2.0	0.5	No	2.5
DT16, DT16B	Main Road, Seaton	Kerbside	301765	530720	NO2	N/A	6.1	1.0	No	2.5
DT17, DT17B	South End Street, Wigton	Urban Background	325568	547874	NO2	N/A	2.9	3.1	No	2.5
DT18, DT18B	West Street, Aspatria	Roadside	314286	541751	NO2	N/A	15.0	2.0	No	2.5

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean 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 2022 (%) [2]	2018	2019	2020	2021	2022
DT1, DT1B	300721	528958	Kerbside	100	100.0	16.0	16.2	13.0	13.1	11.6
DT2, DT2B	301194	528711	Urban Centre	92	100.0	27.4	25.0	21.6	21.8	22.0
DT3, DT3B	311652	530658	Kerbside	100	100.0		19.8	15.0	16.9	15.2
DT4, DT4B	326419	523602	Roadside	100	100.0	26.0	25.5	18.4	21.1	21.6
DT5, DT5B	303778	536534	Kerbside	100	100.0	25.2	23.9	19.7	19.1	20.0
DT6, DT6B	300588	528682	Kerbside	100	100.0	32.0	28.5	22.4	22.3	22.9
DT7, DT7B	325508	548419	Kerbside	100	100.0	23.4	23.7	19.9	20.0	19.3
DT8, DT8B	299591	525545	Roadside	100	100.0	16.8	16.2	12.6	12.5	12.5
DT9, DT9B	315299	542145	Kerbside	100	100.0	16.7	16.0	13.0	12.9	12.5
DT10, DT10B	312091	530547	Kerbside	96	100.0		16.5	12.5	11.7	12.5
DT11, DT11B	327949	523764	Kerbside	96	100.0	21.7	20.2	13.1	14.8	14.1
DT12, DT12B	299939	529709	Kerbside	50	51.9		12.2	10.0	9.7	11.8

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 2022 (%) (2)	2018	2019	2020	2021	2022
DT13, DT13B	313108	529923	Suburban	100	100.0			4.5	4.9	4.1
DT14, DT14B	303671	536648	Urban Background	79	90.4			5.6	6.5	6.5
DT15, DT15B	310949	553517	Industrial	88	100.0				8.3	7.9
DT16, DT16B	301765	530720	Kerbside	79	92.3				9.0	8.8
DT17, DT17B	325568	547874	Urban Background	100	100.0				8.1	7.2
DT18, DT18B	314286	541751	Roadside	100	100.0				12.1	13.4

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **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.TG22 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

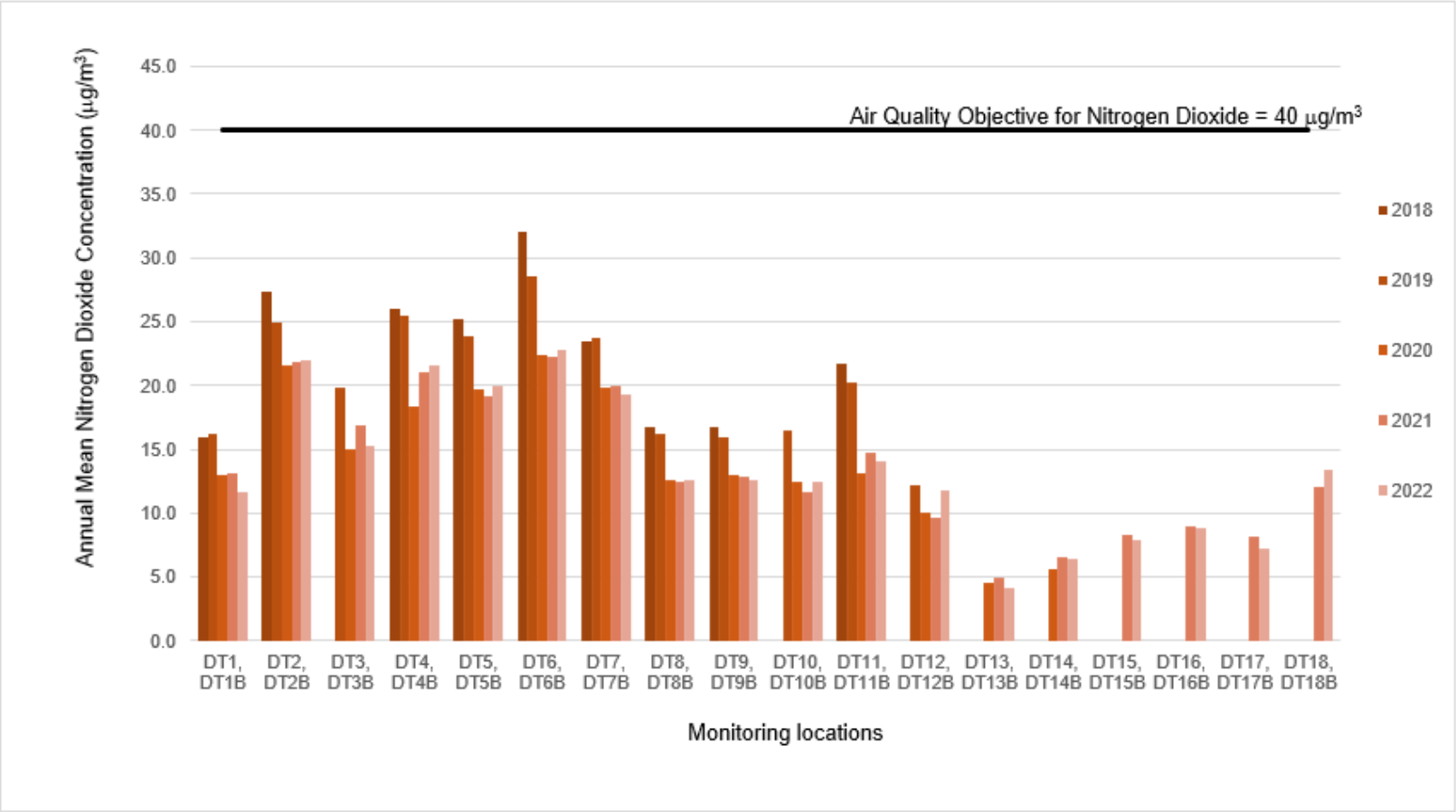


Figure A.1: This graph, presents NO_2 annual mean concentrations for the sites DT1/1B to DT18/18B from 2018 to 2022. There are no exceedances of the annual mean objective in 2022 and there is a general trend of reduction in levels across locations.

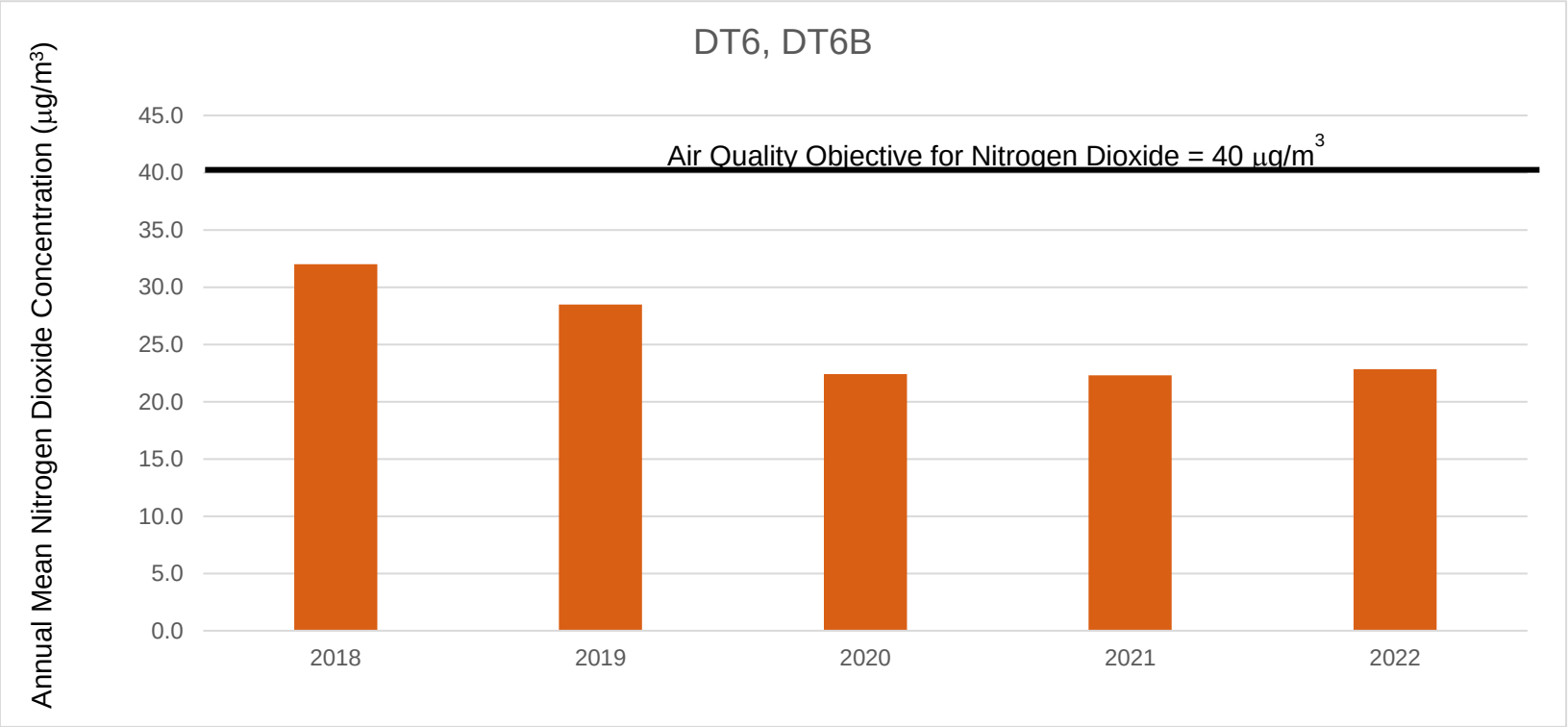


Figure A.2: Trends in Annual Mean NO_2 Concentration for DT6/6B in 2022. This graph presents NO_2 annual mean concentrations for the site DT6/6B from 2018 to 2022. This site is reported to have the highest NO_2 annual mean concentration for 2022. However, there are no exceedances of the annual mean objective in 2022 and there is a general trend of reduction with a marginal increase of NO_2 in 2022.

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <0.76>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	300721	528958	20.3	12.0	19.4	18.2	12.5	10.7	10.9	11.8	13.6	12.9	16.8	24.4	-	-	-	Duplicate Site with DT1 and DT1B - Annual data provided for DT1B only
DT1B	300721	528958	20.0	13.1	19.5	18.2	12.1	11.2	11.6	12.8	15.1	13.4	15.8	21.1	15.3	11.6	-	Duplicate Site with DT1 and DT1B - Annual data provided for DT1B only
DT2	301194	528711	38.6		29.7		23.4	29.0	28.6	27.1	26.7	26.8	24.9	34.0	-	-	-	Duplicate Site with DT2 and DT2B - Annual data provided for DT2B only
DT2B	301194	528711	38.3	30.8	31.0	28.8	27.3	26.8	25.9	26.9	27.7	26.9	23.4	33.1	29.0	22.0	-	Duplicate Site with DT2 and DT2B - Annual data provided for DT2B only
DT3	311652	530658	25.2	18.0	24.9	20.6	16.6	16.0	17.9	17.9	19.9	18.1	20.9	31.7	-	-	-	Duplicate Site with DT3 and DT3B - Annual data provided for DT3B only
DT3B	311652	530658	22.9	18.4	19.4	20.9	17.9	17.1	17.1	18.0	20.2	12.8	18.3	30.4	20.0	15.2	-	Duplicate Site with DT3 and DT3B - Annual data provided for DT3B only
DT4	326419	523602	32.2	28.7	28.7	26.2	21.3	26.2	28.6	33.5	28.5	25.6	25.0	30.7	-	-	-	Duplicate Site with DT4 and DT4B - Annual data provided for DT4B only
DT4B	326419	523602	37.3	29.5	27.3	26.9	27.5	28.1	28.0	32.3	29.5	25.6	26.0	28.2	28.4	21.6	-	Duplicate Site with DT4 and DT4B - Annual data provided for DT4B only
DT5	303778	536534	38.0	21.5	31.0	27.9	24.6	24.6	23.6	25.8	21.1	23.7	24.3	34.8	-	-	-	Duplicate Site with DT5 and DT5B - Annual data provided for DT5B only
DT5B	303778	536534	36.9	25.2	29.4	27.5	17.6	21.9	23.1	24.4	22.6	23.8	27.7	31.2	26.3	20.0	-	Duplicate Site with DT5 and DT5B - Annual data provided for DT5B only
DT6	300588	528682	40.5	20.3	33.5	28.8	26.4	29.1	27.0	26.3	24.0	29.7	31.6	36.9	-	-	-	Duplicate Site with DT6 and DT6B - Annual data provided for DT6B only
DT6B	300588	528682	37.7	25.3	40.3	29.7	28.0	30.3	26.8	26.5	27.1	29.8	28.5	37.5	30.1	22.9	-	Duplicate Site with DT6 and DT6B - Annual data provided for DT6B only
DT7	325508	548419	35.1	22.6	31.4	21.1	21.0	21.1	23.5	24.3	23.0	21.5	21.3	33.8	-	-	-	Duplicate Site with DT7 and DT7B - Annual data provided for DT7B only
DT7B	325508	548419	34.9	24.7	33.0	27.6	17.5	23.2	23.8	24.9	26.0	22.5	21.7	30.0	25.4	19.3	-	Duplicate Site with DT7 and DT7B - Annual data provided for DT7B only
DT8	299591	525545	17.5	10.9	24.5	21.1	12.8	8.4	11.7	15.6	19.8	14.3	15.5	25.7	-	-	-	Duplicate Site with DT8 and DT8B - Annual data provided for DT8B only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <0.76>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT8B	299591	525545	17.1	11.4	26.7	21.1	11.9	8.4	12.9	15.9	20.8	13.5	11.7	26.8	16.5	12.5	-	Duplicate Site with DT8 and DT8B - Annual data provided for DT8B only
DT9	315299	542145	26.5	14.8	19.9	16.9	12.6	14.2	13.6	14.5	14.7	13.4	14.8	24.1	-	-	-	Duplicate Site with DT9 and DT9B - Annual data provided for DT9B only
DT9B	315299	542145	26.8	15.0	16.8	18.0	13.7	12.1	13.9	15.0	15.1	12.7	15.3	21.6	16.5	12.5	-	Duplicate Site with DT9 and DT9B - Annual data provided for DT9B only
DT10	312091	530547	22.7	13.4	22.0	17.2	13.6	11.5	13.5	14.3	16.1	12.9	11.3	25.5	-	-	-	Duplicate Site with DT10 and DT10B - Annual data provided for DT10B only
DT10 B	312091	530547	23.2	15.5	19.2	16.9	14.0	13.4	13.6	15.0	14.9	12.8	17.4		16.5	12.5	-	Duplicate Site with DT10 and DT10B - Annual data provided for DT10B only
DT11	327949	523764	18.2		24.1	19.6	15.6	14.3	17.1	20.8	21.1	19.3	15.9	26.2	-	-	-	Duplicate Site with DT11 and DT11B - Annual data provided for DT11B only
DT11 B	327949	523764	18.8	8.8	24.5	20.5	16.2	13.1	16.4	20.0	19.5	19.2	20.1	27.5	18.6	14.1	-	Duplicate Site with DT11 and DT11B - Annual data provided for DT11B only
DT12	299939	529709					11.3	11.0			32.1	11.6	11.7	18.0	-	-	-	Duplicate Site with DT12 and DT12B - Annual data provided for DT12B only
DT12 B	299939	529709					10.9	10.3			29.0	10.9	14.1	16.2	15.6	11.8	-	Duplicate Site with DT12 and DT12B - Annual data provided for DT12B only
DT13	313108	529923	9.2	5.9	8.2	5.3	3.7	3.8	4.2	4.2	4.5	4.4	5.5	6.0	-	-	-	Duplicate Site with DT13 and DT13B - Annual data provided for DT13B only
DT13 B	313108	529923	8.6	5.4	8.4	5.0	3.5	4.5	4.3	4.6	4.3	4.5	6.4	5.9	5.4	4.1	-	Duplicate Site with DT13 and DT13B - Annual data provided for DT13B only
DT14	303671	536648	13.2	8.9	13.4	8.2	6.9	6.9	7.5	6.8	6.2				-	-	-	Duplicate Site with DT14 and DT14B - Annual data provided for DT14B only
DT14 B	303671	536648	13.4		11.0	8.5	7.5	7.1	7.1	.5.7	5.7	6.8	10.1		8.5	6.5	-	Duplicate Site with DT14 and DT14B - Annual data provided for DT14B only
DT15	310949	553517	14.5		14.0	12.4			9.4	11.0	8.4	8.5	9.6	15.2	-	-	-	Duplicate Site with DT15 and DT15B - Annual data provided for DT15B only
DT15 B	310949	553517	15.1	10.9	14.7	12.4	7.4	9.6	9.7		9.5	8.8	5.8	14.7	10.5	7.9	-	Duplicate Site with DT15 and DT15B - Annual data provided for DT15B only
DT16	301765	530720	17.8		16.3	12.1	10.8	10.6	10.4	10.0	9.7	5.5			-	-	-	Duplicate Site with DT16 and DT16B - Annual data provided for DT16B only
DT16 B	301765	530720	16.2		16.5	10.7	11.2	9.9	10.3	9.4		4.8	11.1	15.0	11.6	8.8	-	Duplicate Site with DT16 and DT16B - Annual data provided for DT16B only
DT17	325568	547874	9.6	6.4	15.8	9.6	7.2	5.6	7.3	7.7	9.9	7.7	10.8	15.9	-	-	-	Duplicate Site with DT17 and DT17B - Annual data provided for DT17B only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <0.76>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT17B	325568	547874	9.1	7.6	15.4	9.9	6.9	5.9	7.1	8.3	10.2	6.8	10.8	15.7	9.5	7.2	-	Duplicate Site with DT17 and DT17B - Annual data provided for DT17B only
DT18	314286	541751	17.9	15.8	23.5	17.8	13.3	11.1	11.7	13.2	17.1	16.7	22.3	24.0	-	-	-	Duplicate Site with DT18 and DT18B - Annual data provided for DT18B only
DT18B	314286	541751	18.5	16.6	23.8	17.5	15.3	13.1	15.0	15.1	17.8	21.2	18.0	26.3	17.6	13.4	-	Duplicate Site with DT18 and DT18B - Annual data provided for DT18B 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.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **Allerdale Borough Council confirm that all 2022 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 the Allerdale Borough Council Area During 2022

Allerdale Borough Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by Allerdale Borough Council Area During 2022

Allerdale Borough Council has not completed any additional works within the reporting year of 2022. Other than has plans to reposition monitoring locations and repositioning of DT13/13B and DT14/14B in January 2023.

QA/QC of Diffusion Tube Monitoring

Monitoring has been completed in adherence with the 2022 LAQM Diffusion Tube Monitoring Calendar. Whereby Tubes are changed on the specified date. If not, tubes may be changed within ±2 days of the due date. SOCOTEC DIDCOT is the laboratory that supplies and analyses the diffusion tubes collected by Allerdale Borough Council. The diffusion tube supplier was not changed part way through the year of 2022. In the AIR-PT inter comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a satisfactory laboratory. DEFRA information indicates the laboratory precision as good for all 2022 data. The Nitrogen Dioxide tubes are prepared by spiking acetone: triethanolamine (50:50) onto grids prior to the tubes being assembled. They are desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet (UV) detection. The results are initially calculated assuming an

ambient temperature of 11 °C and are adjusted to 20 °C to allow for direct comparison with EU limits.

Diffusion Tube Annualisation

Data capture across the 18 sites was not less than 75% of the 12-month monitoring period; apart from site DT12/12B. Therefore, in line with TG22, annualisation of the data for DT12/12B was required and the results from this are presented in Table C.1. The Diffusion Tube Data Processing Tool was used to complete this annualisation. From consultation with LAQM Helpdesk, only 3 described monitors for annualisation were used as deemed as appropriate due to there being a limited number of 2-4 automatic monitors within a 50-mile range from Allerdale House, Workington. Therefore, 3 continuous monitoring sites selected included were: Newcastle Centre, Blackpool Marton (all background sites) and Carlisle Roadside (roadside site), as all these sites had >85% data capture. These were selected as it was deemed justifiable given their location and in relation to Allerdale House, Workington and nearby DT12/12B as the most appropriate sites to assist with the annualisation required. Therefore, Carlisle Morton (distance of 31.2 miles), Newcastle Centre (distance of 91.7 miles) and Blackpool Marton (distance of 104 miles) were therefore selected for annualisation.

Table C.1 – Annualisation Summary (concentrations presented in µg/m^3)

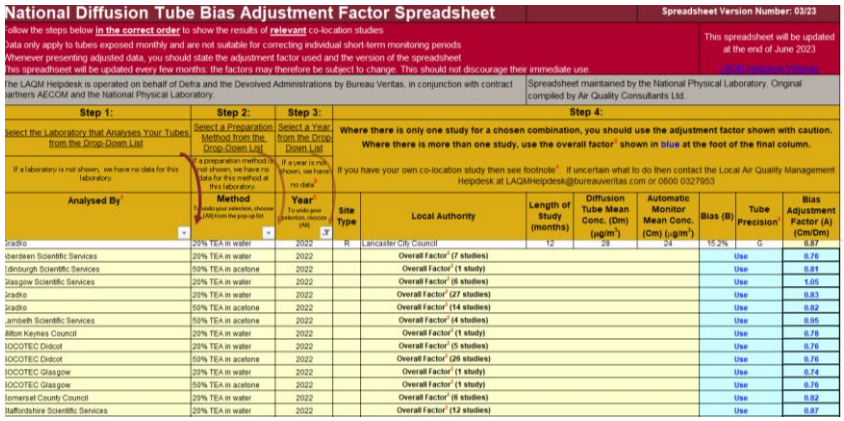
Site ID	Annualisation Factor (Carlisle Morton A595)	Annualisation Factor (Blackpool Morton Background)	Annualisation Factor (Newcastle Centre Background)	Annualisation Factor (-)	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
DT12	0.9936	1.0202	0.9788	-	0.9984	-	-
DT12B	0.9963	1.0202	0.9788	-	0.9984	15.6	15.6

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 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.TG22 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.

Allerdale Borough Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A national bias adjustment factor was selected to the absence of a co-location study. As well as consideration of relevant factors such as: tube exposure, length of monitoring study and Quality Assurance and Quality Control associated with the supplier and preparation method as per the LAQM TG22 Guidance. Historic National Bias Adjustment Factors are presented in Table C.2. The overall national factor selected was SOCOTEC Didcot (50% TEA in Acetone) based on 26 studies applicable to the factor from the 03/23 version of the national spreadsheet as the most recent spreadsheet at the time of writing this report (see Figure C.1).


National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2023

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data.

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor shown in blue at the foot of the final column. If you have your own co-location study then see footnote. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Lancaster City Council	12	28	24	15.2%	G	0.87
Aberdeen Scientific Services	20% TEA in water	2022		Overall Factor (7 studies)				Use		0.76
Edinburgh Scientific Services	50% TEA in acetone	2022		Overall Factor (1 study)				Use		0.81
Glasgow Scientific Services	20% TEA in water	2022		Overall Factor (6 studies)				Use		1.05
Gradko	20% TEA in water	2022		Overall Factor (27 studies)				Use		0.83
Gradko	50% TEA in acetone	2022		Overall Factor (14 studies)				Use		0.82
Lambeth Scientific Services	50% TEA in acetone	2022		Overall Factor (4 studies)				Use		0.95
Milton Keynes Council	20% TEA in water	2022		Overall Factor (1 study)				Use		0.78
SOCOTEC Didcot	20% TEA in water	2022		Overall Factor (5 studies)				Use		0.76
SOCOTEC Didcot	50% TEA in acetone	2022		Overall Factor (26 studies)				Use		0.76
SOCOTEC Glasgow	20% TEA in water	2022		Overall Factor (1 study)				Use		0.74
SOCOTEC Glasgow	50% TEA in acetone	2022		Overall Factor (1 study)				Use		0.76
Somerset County Council	20% TEA in water	2022		Overall Factor (6 studies)				Use		0.82
Staffordshire Scientific Services	20% TEA in water	2022		Overall Factor (12 studies)				Use		0.87

Figure C.1 National Bias Adjustment Spreadsheet

A summary of bias adjustment factors used by Allerdale Borough Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	National	03/21	0.77
2019	National	03/20	0.75
2018	National	03/19	0.76

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within Allerdale Borough Council required distance correction during 2022.

NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure has been estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1. No automatic NO_2 monitoring locations within the Allerdale Borough Council area required distance correction during 2022.

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

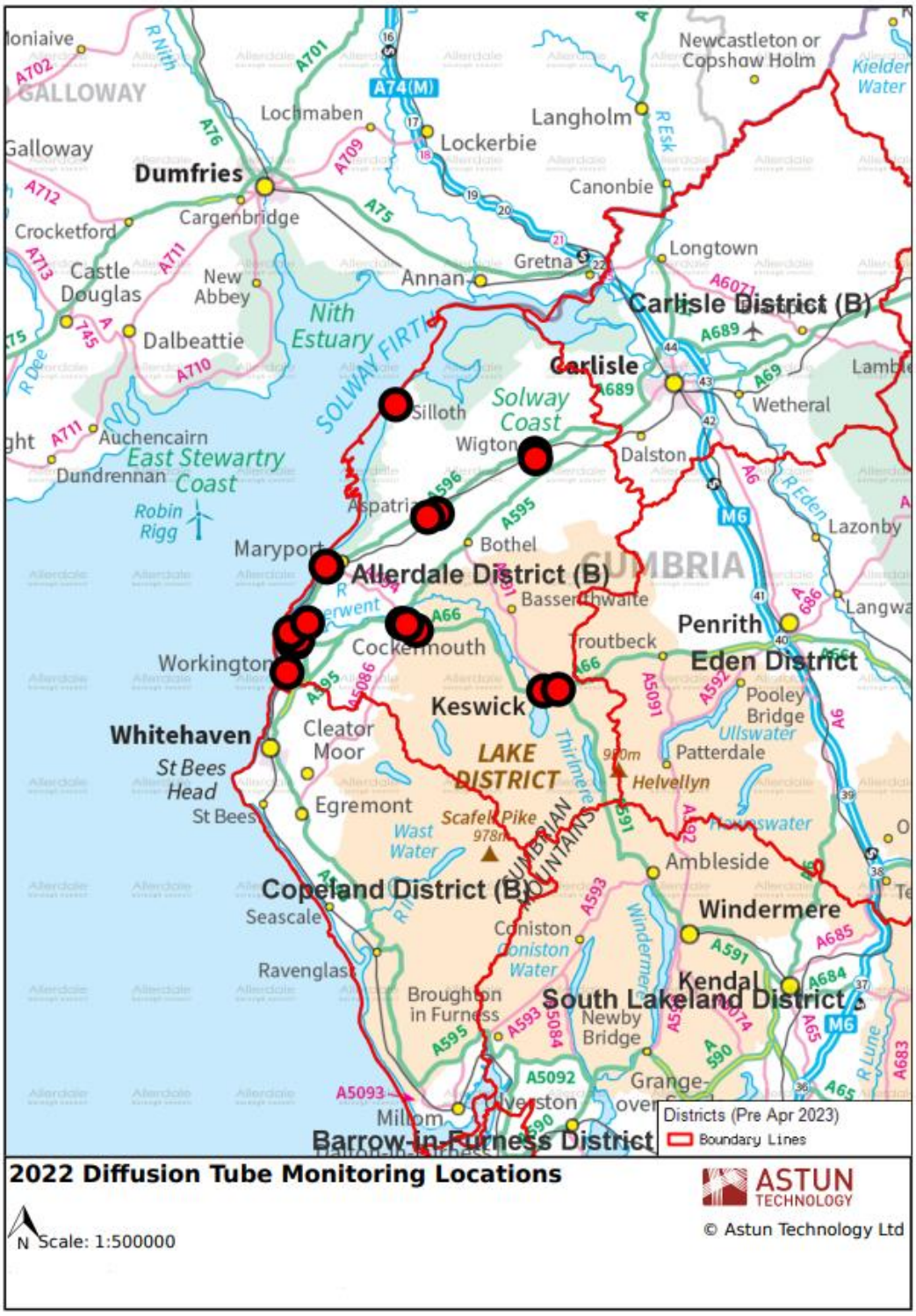


Figure D.1 – Map of Non-Automatic Monitoring Sites

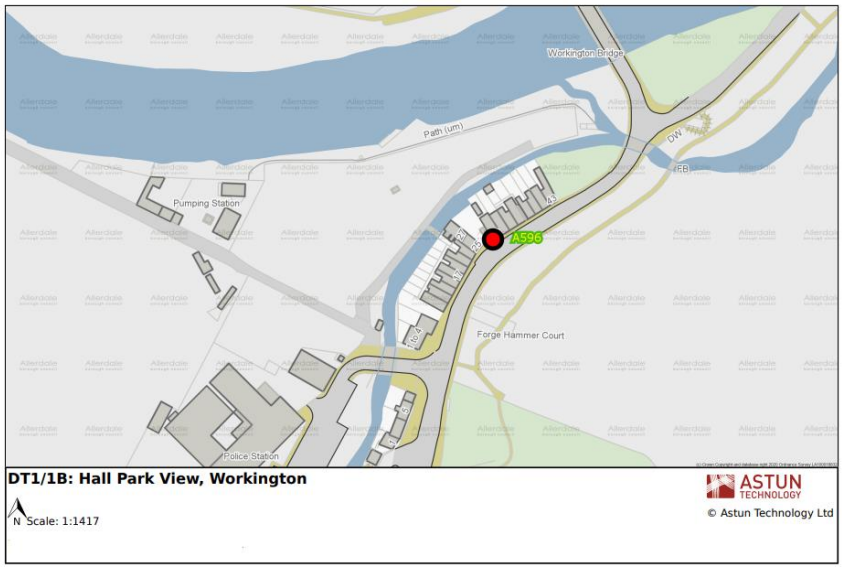


Figure D.1. Presents a map of DT1/DT1B monitoring location.

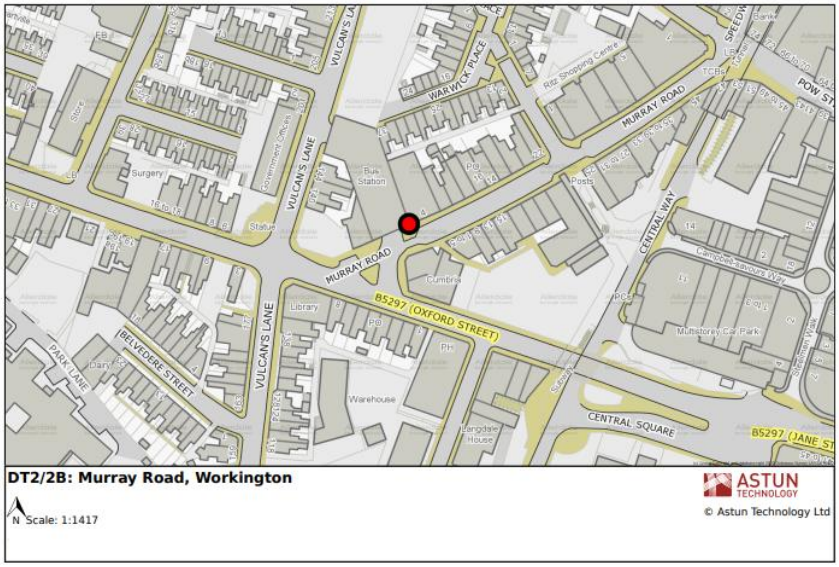


Figure D.2. Presents a map of DT2/DT2B monitoring location.

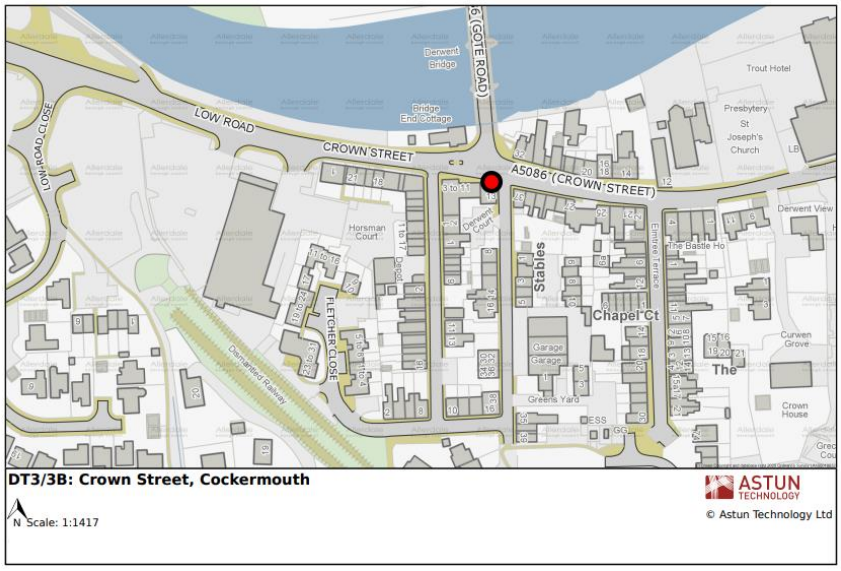


Figure D.3. Presents a map of DT3/DT3B monitoring location.

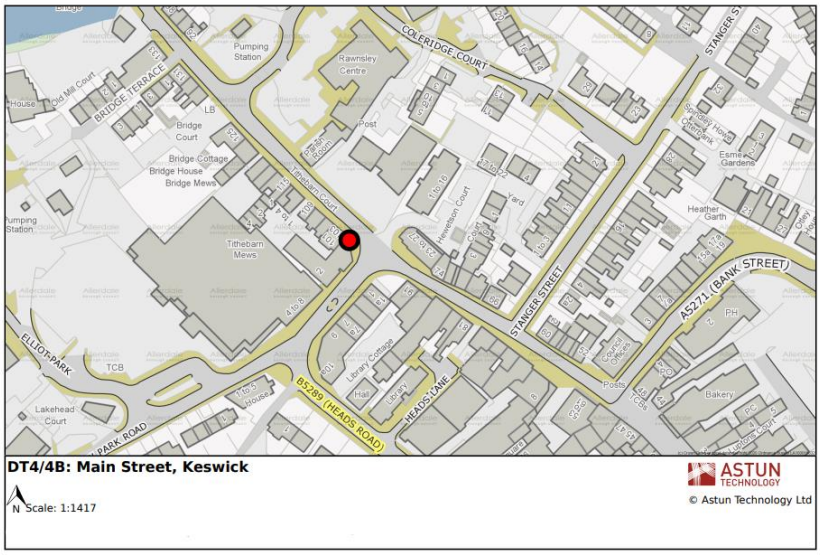


Figure D.4. Presents a map of DT4/DT4B monitoring location.

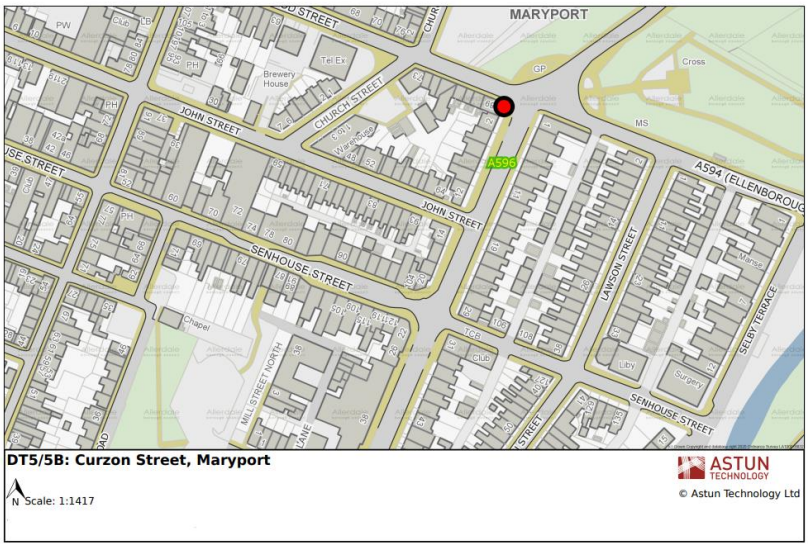


Figure D.5. Presents a map of DT5/DT5B monitoring location.

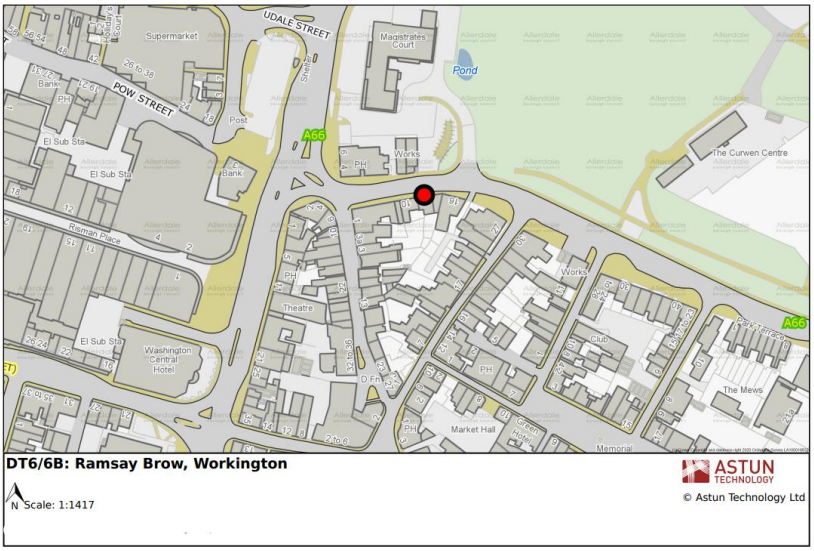


Figure D.6.. Presents a map of DT6/DT6B monitoring location.

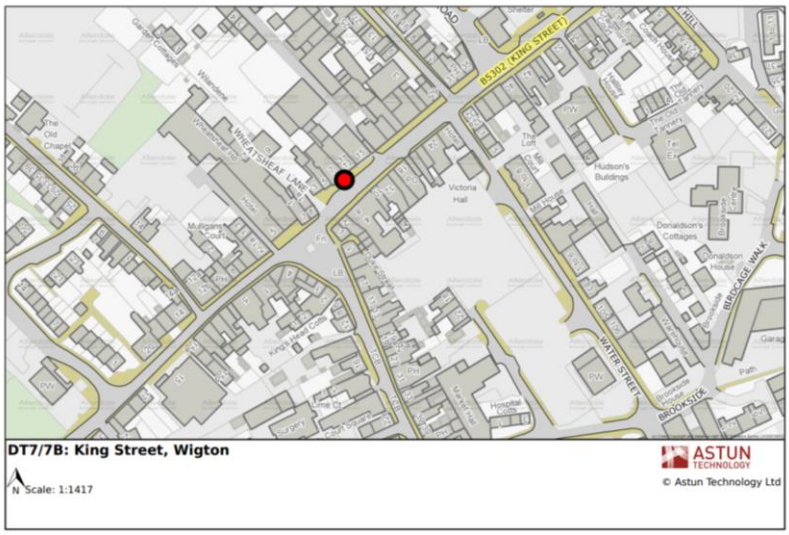


Figure D.7. Presents a map of DT7/DT7B monitoring location.

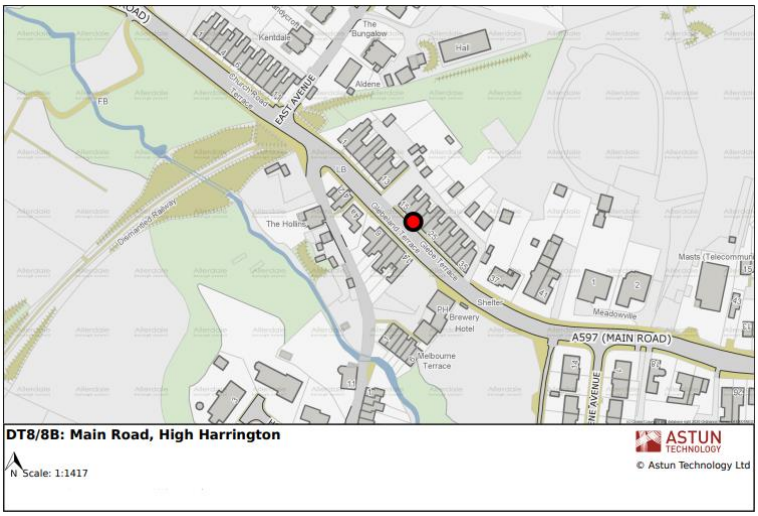


Figure D.8. Presents a map of DT8/DT8B monitoring location.

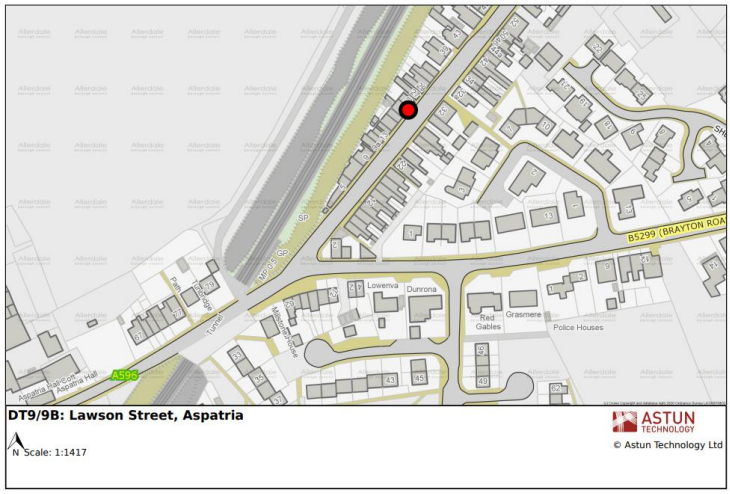


Figure D.9. Presents a map of DT9/DT9B monitoring location.

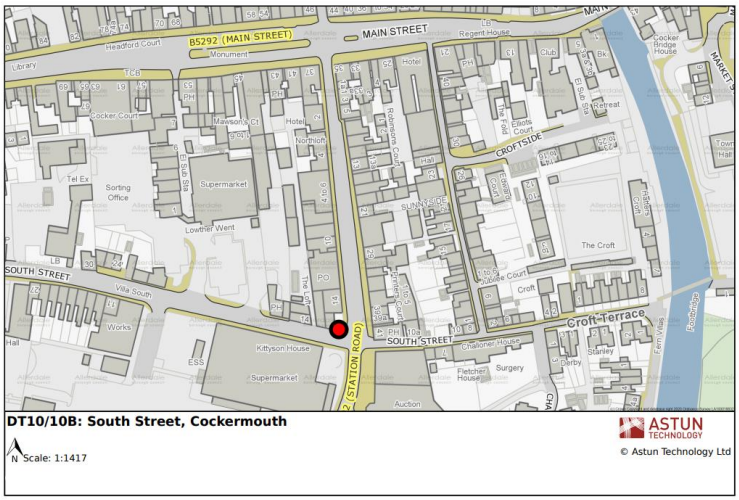


Figure D.10. Presents a map of DT10/DT10B monitoring location.

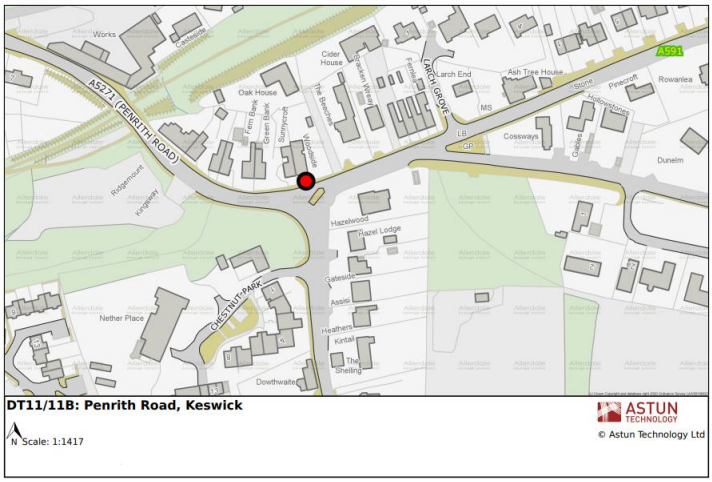


Figure D.11. Presents a map of DT11/DT11B monitoring location.

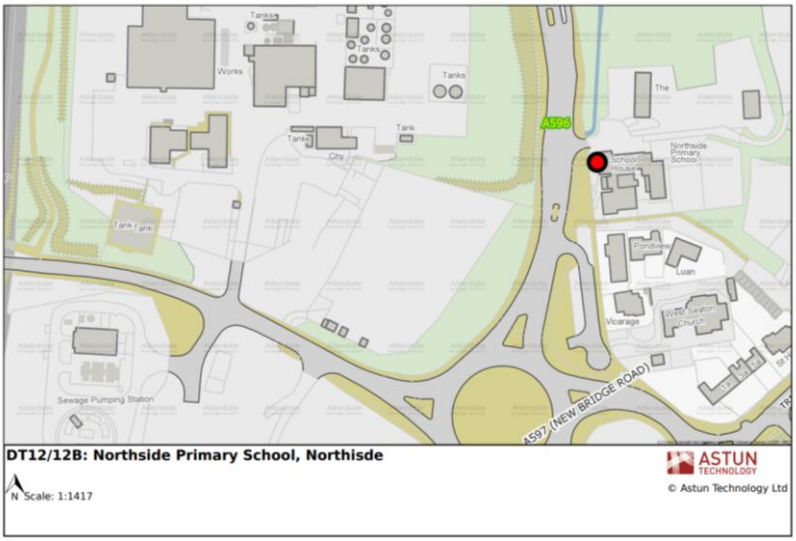


Figure D.12. Presents a map of DT12/DT12B monitoring location.

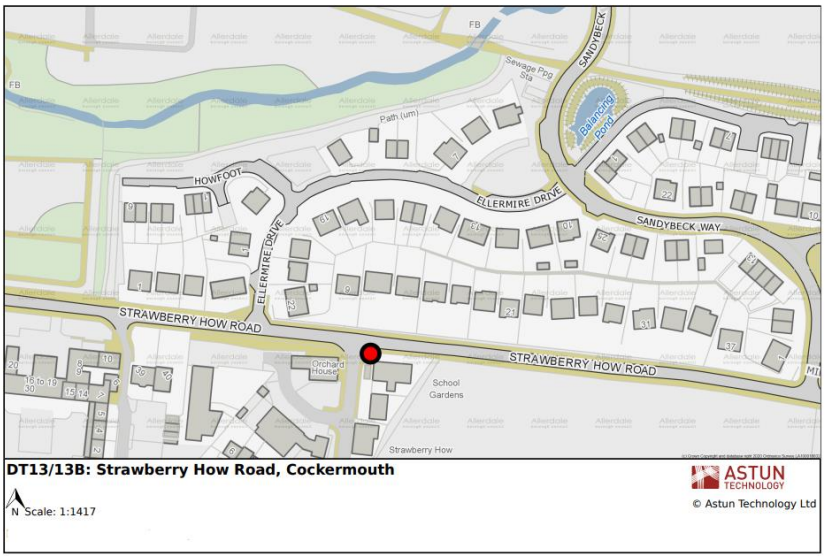


Figure D.13. Presents a map of DT13/DT13B monitoring location.

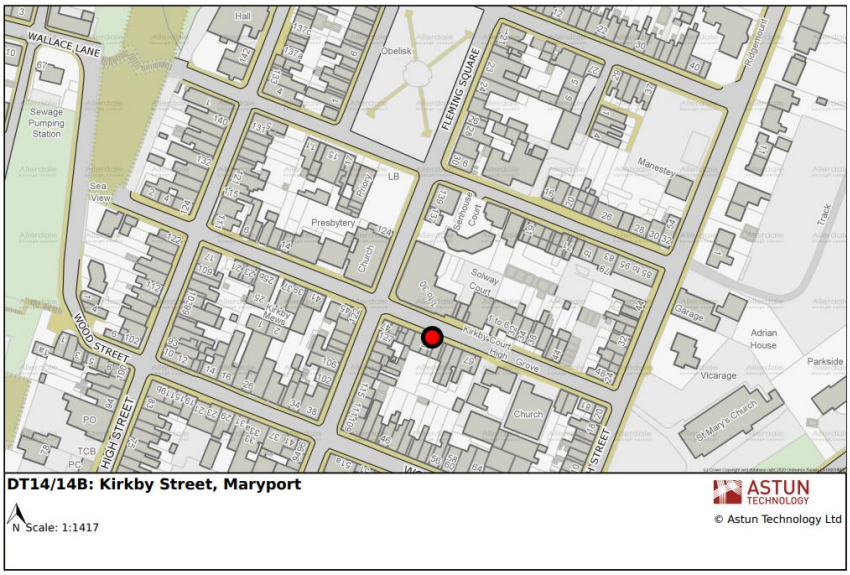


Figure D.14. Presents a map of DT14/DT14B monitoring location.

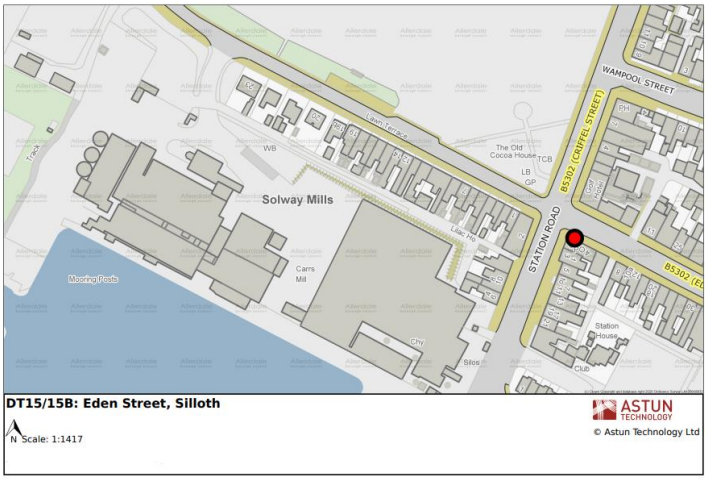


Figure D.15. Presents a map of DT15/DT15B monitoring location.

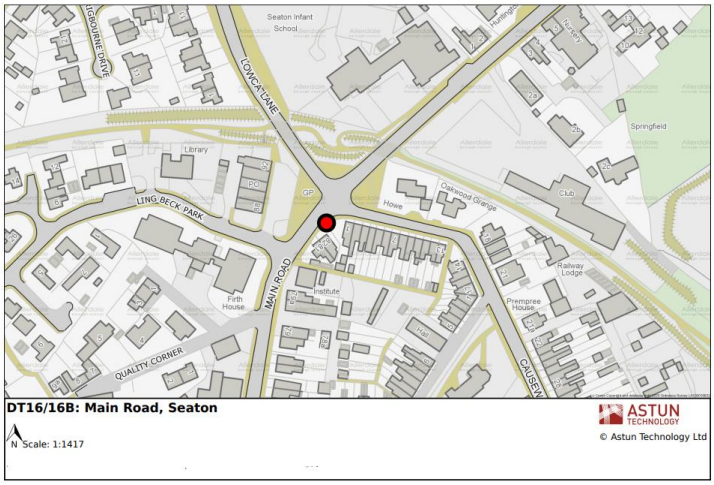


Figure D.16. Presents a map of DT16/DT16B monitoring location.

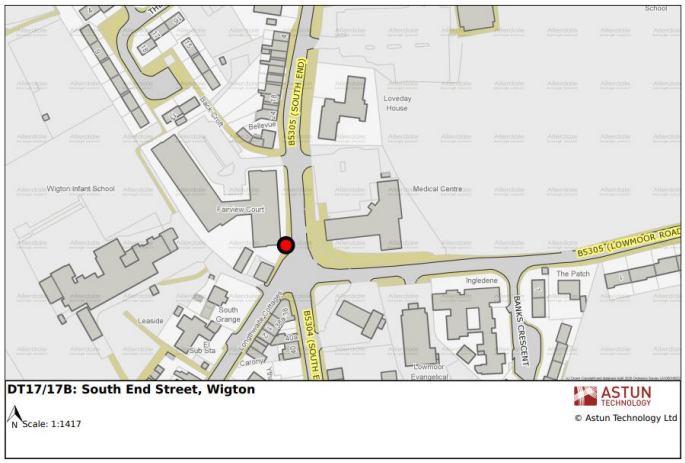


Figure D.17. Presents a map of DT17/DT17B monitoring location.

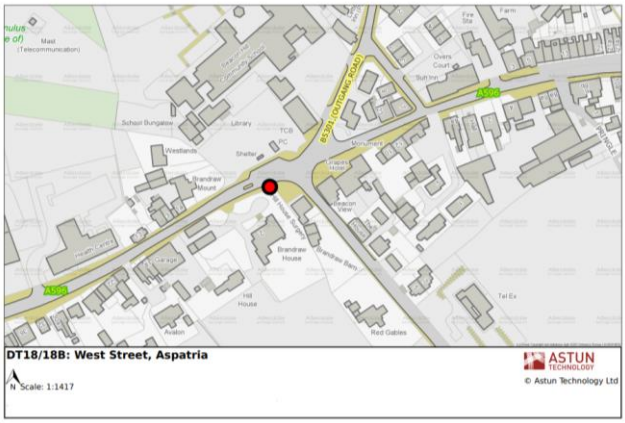


Figure D.18. Presents a map of DT18/DT18B monitoring location.

Figure D.20. Presents a map of the Smoke Control Area within the red boundary in relation to the nearby non-automatic (diffusion tube) monitoring locations.

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

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

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Cumbria Observatory. (2011). 'Key Statistics – Environment'. Available at: https://www.cumbriaobservatory.org.uk/environment/. (Date of access: 15/06/2023).
- Defra. (2018). 'Domestic Solid Fuel Regulations'. Available at: https://consult.defra.gov.uk/airquality/domestic-solid-fuel-regulations/. (Date of access: 09/06/2022).
- HETAS. (2021). 'The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020'. Available at: Air Quality (Domestic Solid Fuels Standards) (England) Regulations (hetas.co.uk) (Date of access: 15/06/2023).
- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022. 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.PG22. August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Public Health England (2018). 'Health Matters Air Pollution'. Available at: Health matters: air pollution - GOV.UK (www.gov.uk). (Date of access: 20/06/2023).
- Public Health Outcomes Framework. (2021) 'Wider Determinants of Health' .Wider Determinants of Health - Data - OHID (phe.org.uk). (Date of access: 15/06/2023)
- The Health Foundation. (2020). 'Health Equity in England: The Marmot Review 10 Years On'. Available at: Health Equity in England: The Marmot Review 10 Years On - The Health Foundation (Date of access: 15/06/2023).